2012 - JCR Evaluation Form

SPECIES: Pronghorn PERIOD: 6/1/2012 - 5/31/2013

HERD: PR740 - CHEYENNE RIVER

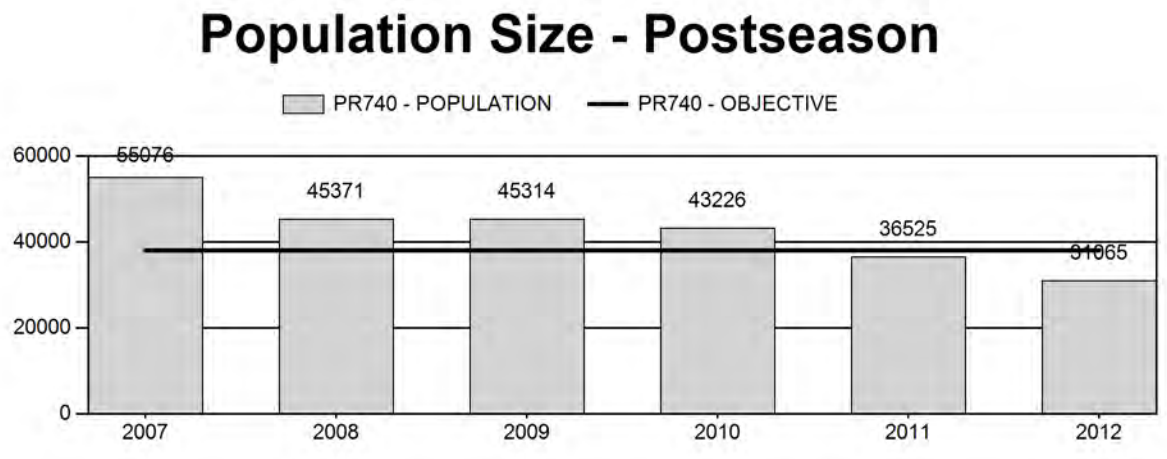
HUNT AREAS: 4-9, 27, 29 PREPARED BY: JOE SANDRINI

	2007 - 2011 Average	2012	2013 Proposed
Population:	45,102	31,065	33,120
Harvest:	6,290	4,269	3,785
Hunters:	6,523	4,826	4,250
Hunter Success:	96%	88%	89%
Active Licenses:	7,198	5,184	4,560
Active License Percent:	87%	82%	83%
Recreation Days:	22,295	19,330	17,000
Days Per Animal:	3.5	4.5	4.5
Males per 100 Females	57	44	
Juveniles per 100 Females	62	63	

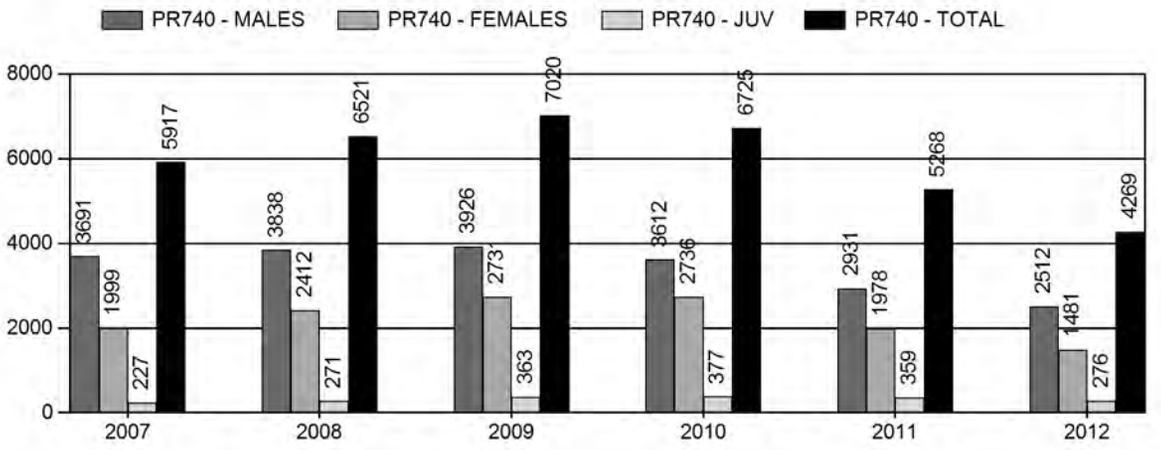
Population Objective:	38,000
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-18.2%
Number of years population has been + or - objective in recent trend:	2
Model Date:	04/09/2013

Proposed harvest rates (percent of pre-season estimate for each sex/age group):

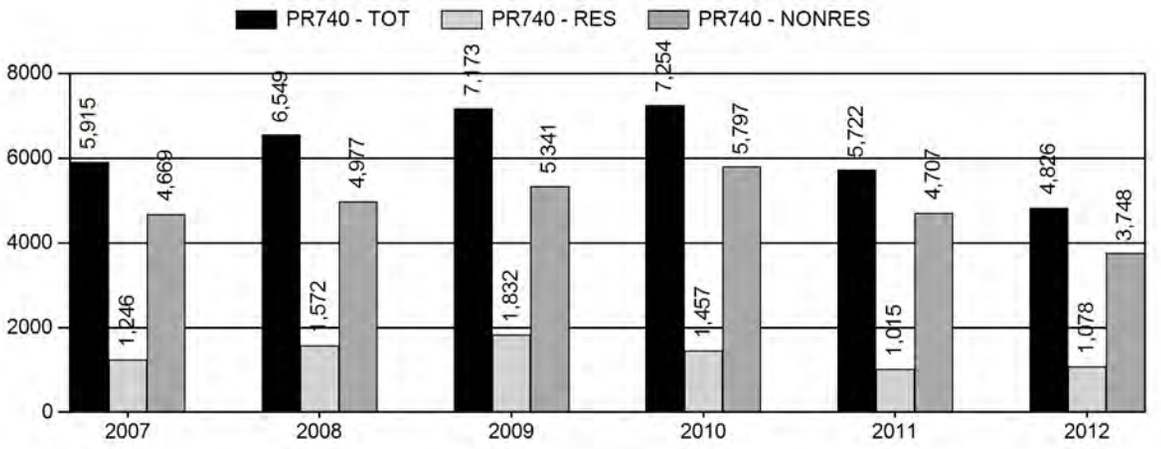
	JCR Year	Proposed
Females ≥ 1 year old:	9.6%	7.5%
Males ≥ 1 year old:	34.0%	29.0%
Juveniles (< 1 year old):	2.8%	2.3%
Total:	13.0%	11.2%
Proposed change in post-season population:	-15.0%	+6.5%



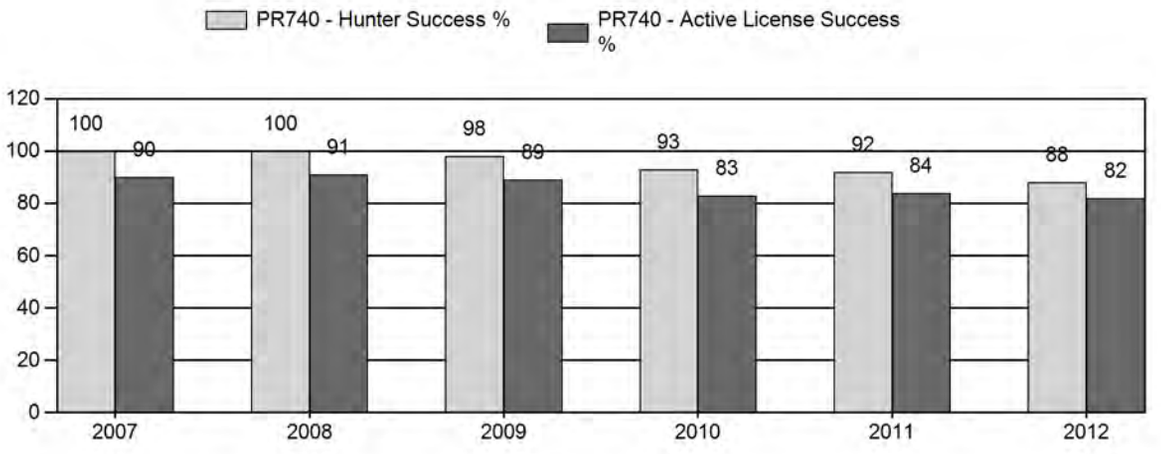
Harvest



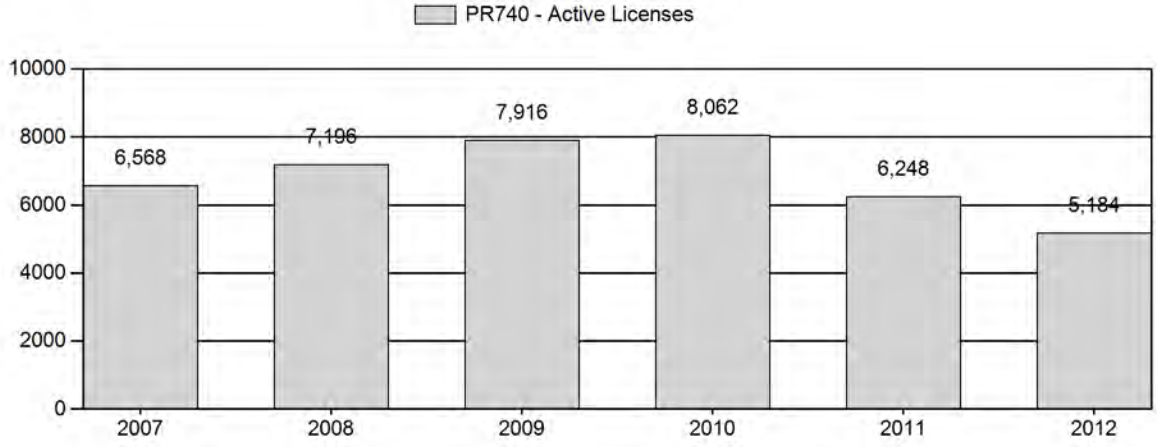
Number of Hunters



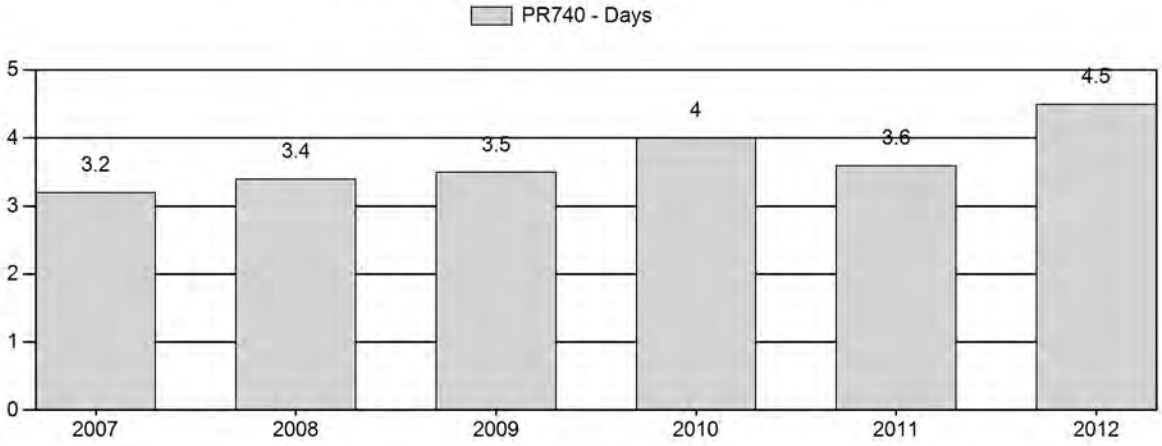
Harvest Success



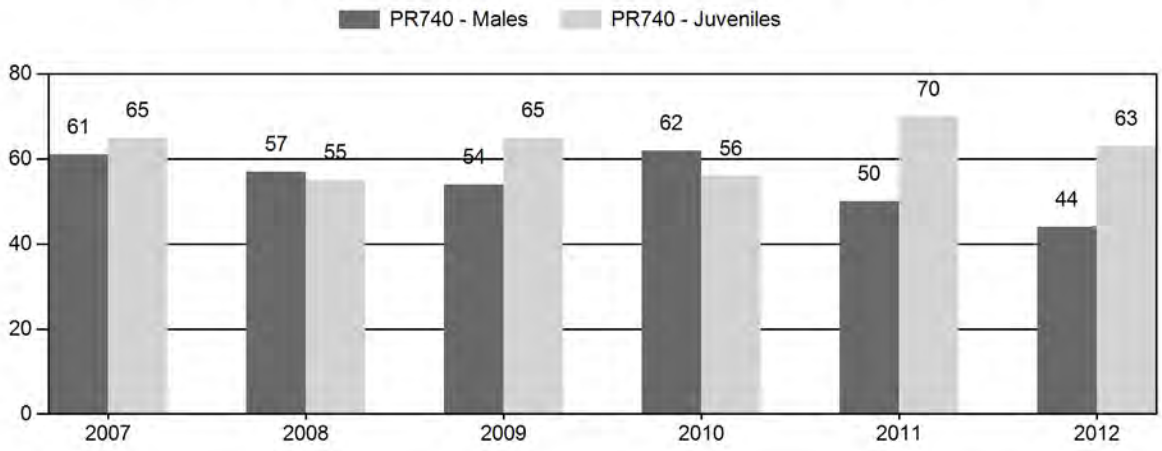
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2007 - 2012 Preseason Classification Summary

for Pronghorn Herd PR740 - CHEYENNE RIVER

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2007	61,548	515	772	1,287	27%	2,103	44%	1,362	29%	4,752	2,513	24	37	61	± 3	65	± 4	40
2008	52,544	601	1,081	1,682	27%	2,950	47%	1,630	26%	6,262	1,982	20	37	57	± 3	55	± 3	35
2009	53,036	395	1,101	1,496	25%	2,757	46%	1,802	30%	6,055	2,429	14	40	54	± 3	65	± 3	42
2010	50,623	411	1,054	1,465	29%	2,345	46%	1,309	26%	5,119	2,261	18	45	62	± 3	56	± 3	34
2011	42,320	208	695	903	23%	1,796	45%	1,258	32%	3,957	2,624	12	39	50	± 3	70	± 4	47
2012	35,760	202	462	664	21%	1,513	48%	960	31%	3,137	2,156	13	31	44	± 3	63	± 4	44

2013 HUNTING SEASONS
CHEYENNE RIVER PRONGHORN HERD (PR740)

Hunt Area	Type	Season Dates Opens	Closes	Quota	Limitations
4	1	Oct. 1	Nov. 20	100	Limited quota licenses; any antelope
	6	Oct. 1	Nov. 20	25	Limited quota licenses; doe or fawn
5	1	Oct. 1	Nov. 20	100	Limited quota licenses; any antelope
	6	Oct. 1	Nov. 20	50	Limited quota licenses; doe or fawn valid on private land
6	1	Oct. 1	Oct. 15	350	Limited quota licenses; any antelope
7	1	Oct. 1	Oct. 15	350	Limited quota licenses; any antelope
	6	Oct. 1	Oct. 15	25	Limited quota licenses; doe or fawn
8	1	Oct. 1	Oct. 15	450	Limited quota licenses; any antelope
9	1	Oct. 1	Oct. 31	700	Limited quota licenses; any antelope; also valid in that portion of Area 11 in Converse or Niobrara counties
	6	Oct. 1	Oct. 31	1,250	Limited quota licenses; doe or fawn; also valid in that portion of Area 11 in Converse or Niobrara counties
27	1	Oct. 1	Oct. 15	400	Limited quota licenses; any antelope
	6	Oct. 1	Oct. 15	150	Limited quota licenses; doe or fawn
29	1	Oct. 1	Oct. 15	150	Limited quota licenses; any antelope
	2	Oct. 1	Oct. 15	550	Limited quota licenses; any antelope valid on private land
	6	Oct. 1	Oct. 15	200	Limited quota licenses; doe or fawn valid on private land
	7	Oct. 1	Nov. 15	200	Limited quota licenses; doe or fawn valid south and west of Interstate Highway 25

- continued –

Hunt Area	Type	Season Dates Opens	Closes	Quota	Limitations
Archery 4 & 5		Sept. 1	Sept. 30		Refer to license type and limitations in Section 3.
Archery 6 - 9, 27 & 29		Aug. 15	Sept. 30		Refer to license type and limitations in Section 3.

SUMMARY OF PROPOSED CHANGES IN LICENSE NUMBER

Hunt Area	License Type	Quota change from 2012
6	6	-25
7	7	-25
8	6	-50
27	1	-100
27	6	-50
29	1	-650
29	2	+550
29	6	-350
Herd Unit Total	**1**	**-750**
	2	**+550**
	6	**-475**
	7	**-25**

Management Evaluation
Current Management Objective: 38,000
Management Strategy: Recreational
2012 Postseason Population Estimate: ~ 31,000
2013 Proposed Postseason Population Estimate: ~ 33,100

HERD UNIT ISSUES: The management objective of the Cheyenne River Pronghorn Herd Unit is for an estimated post-season population of 38,000 pronghorn. This herd is managed under the recreational management strategy. The population objective and management strategy were set in 1999 when this herd was created by combining the South Black Hills and Thunder Basin Pronghorn Herd Units. The objective is slated for review and possible revision during bio-year 2013.

The Cheyenne River Pronghorn herd unit encompasses much of northeastern Wyoming. Because of the disparity of habitats across the herd unit and the preponderance of private land, this herd unit is managed for recreational hunting. The herd unit encompasses 7,466 mi^2, of

which 6,443 mi^2 is considered occupied pronghorn habitat. Most of the unoccupied habitat is found in Hunt Areas (HA) 4 and 5, which include a portion of the Black Hills having topographical and vegetative features unsuitable for pronghorn. Approximately 77% of this herd unit is private land. The remaining 23% includes lands managed by the United States Forest Service (USFS), the Bureau of Land Management (BLM), and the State of Wyoming. Most of the USFS lands are part of the Thunder Basin National Grassland (TBNG) and located in Hunt Areas 5, 6, 7, 27, and 29. The State of Wyoming owns a large parcel of land in Hunt Area 9. Remaining public lands are scattered throughout the herd unit, and most are accessible only by crossing private lands. Access fees for hunting are common on private land, and many landowners have leased their property to outfitters. Therefore, accessible public lands are subjected to heavy hunting pressure.

Major land uses in this herd unit include livestock grazing, oil and gas production, timber harvest, and farming. There are several oil and gas fields which occur primarily in Hunt Areas 6, 7, 8, and 29, and development pressure has increased in recent years in Hunt Areas 8 and 29. Two surface coal mines represent a substantial land use within Hunt Area 27. Farming generally occurs in the southern most portion of the herd unit, but there are a number of wheat, oat, and alfalfa fields near Sundance and Upton. When pronghorn numbers are high, damage to growing alfalfa can become an issue.

WEATHER: The winter of 2010-11 was very harsh in the northern half of the herd unit, and the 2012 summer was the driest on record. Over-winter mortality was well above average in bio-year 2010, and losses of all ages of pronghorn continued into the spring. The warm, dry conditions that beset the area during the end of bio-year 2011 continued through the 2012-13 winter. April of 2013 finally saw a break in the drought when temperatures dropped below normal for the entire month, and significant precipitation was again received (http://www.ncdc.noaa.gov/temp-and-precip/). Overall, the weather pattern during bio-year 2012 resulted in poor forage production, reduced recruitment, and average over-winter survival of all age classes of pronghorn. Tougher winter and spring conditions since 2008 combined with the recent dry summer have likely reduced fawn productivity and survival the past five years. Until recently, hunting seasons have been designed to reduce pronghorn numbers, and harvest along with reduced recruitment and the severe 2010-11 winter have all contributed this population's decline.

HABITAT: This herd unit is dominated by Wyoming big sagebrush (*Artemesia tridentata wyomingensis*), silver sagebrush (*Artemesia cana*), and mid-prairie grasses such as wheatgrasses (*Agropyron* spp.), grama grasses (*Bouteloua* spp.), and needle grasses (*Stipa* spp.). In addition, there are several major drainages within occupied habitat dominated by plains cottonwood (*Populus deltoides*) and greasewood (*Sarcobatus vermiculatus*). These drainages include the Cheyenne River, Antelope Creek, Black Thunder Creek, Beaver Creek, Old Woman Creek, Hat Creek, and Lance Creek. Steep canyons dominate the southern Black Hills portion of the herd unit, and there vegetation consists of ponderosa pine (*Pinus ponderosa*) and its associated savannah. Some areas are dominated by agricultural croplands, notably near the towns of Douglas, Lusk, Upton, and Sundance.

Habitat suitability for pronghorn varies greatly throughout the herd unit. Much of the habitat in the northeast portion of the herd unit is marginal, consisting of topography and vegetation not particularly suitable for pronghorn. The west-central portions of the herd unit represent the best block of contiguous sagebrush habitat. While the eastern and southern sections of the herd unit are dominated more by mid-grass prairie and agricultural lands, but locally do support good numbers of pronghorn. Habitat disturbance throughout the herd unit is generally high. There are a number of developed oil fields and areas impacted by bentonite and coal mining. In the central and southern portions of the herd unit, historic brush control projects have decreased the amount of sagebrush available for wintering pronghorn at many sites, yet pronghorn still winter in this region. Habitat loss and fragmentation is expected to continue and negatively impact this herd. Based upon current exploration and leasing trends, the amount of disturbance caused by oil and gas activities will continue to increase in Hunt Areas 8 and 29. In addition, a large wind farm is planned in Hunt Area 29.

Beginning in the fall of 2001, Department personnel established Wyoming big sagebrush monitoring transects within the herd unit. Forage conditions away from irrigated fields within this herd unit were poor between 2001 and 2004, improved substantially in 2005, and then declined dramatically during 2006, when severe drought plagued the herd unit. Based on these transects, forage conditions rebounded in 2007, and remained good in 2008 and 2009. Leader production measurements were suspended in 2010, but over-winter estimates of use have continued. As previously mentioned, sagebrush leader growth improved in 2007, however, the post-season population of this herd peaked that year and winter use of sagebrush leaders was excessive.[1] It was apparent the population of pronghorn and other animals browsing sagebrush at that time was not sustainable. Increased harvest along with reduced recruitment and survival began to push this pronghorn population down; and, as this herd declined, winter use of sagebrush dropped and range conditions improved through 2011. Then, the severe drought of 2012 resulted in very poor forage production and elevated use during and after the growing season.

FIELD DATA: This population's recent decline was accentuated during the winter of 2010-2011, which was very severe in the northern half of the herd unit and tough in other locations as well. During this winter, large scale movements of pronghorn and increased mortality were observed. However, the winters of 2011-2012 and 2012-13 were generally mild. Weather during the 2012 bio-year has been extremely dry and warmer than normal, and it was the driest on record in many areas. Drought this bio-year appears to have negatively impacted fawn survival, as the fawn:doe ratio decreased to 62:100 from the 70:100 observed in 2011. The 2012 observed value is equal to the mean observed since 2007, and 14% below the longer-term average of 72:100.

It appears over the last 30 years annual productivity of this herd, as measured by preseason fawn:doe ratios, has generally declined (Figure 1). This is thought to be the result of a reduction in habitat quantity and quality, intensified by drought, succession and aging of sagebrush, and over-browsing from both domestic livestock and wildlife. However, productivity was fairly stable and generally good between 1998 and 2006 *(avg. 78; std. dev. 6.3).* A situation credited to mild winters persisting during intensifying drought, even though this population was estimated to be above objective most years. However, as this population moved more significantly above

[1] Different technique applied to measure utilization in 2007. Results may not be directly comparable to previous years.

objective beginning in 2005 and drought continued, fawn:doe ratios began to decline. This trend continued even with the alleviation of drought in 2008 and the advent of a declining population. During this time frame severe snow storms plagued the herd unit each April and May. In addition, June weather each year was cooler and wetter than normal. This combination is believed to have increased post-season mortality of adults and reduced survival of fawns. Predation of fawns may have also increased during this time as well, as small animal populations dropped throughout the herd unit. As a result, since 2007 the herd's preseason fawn:doe has averaged only 62 fawns per 100 does *(std. dev 5.7).*

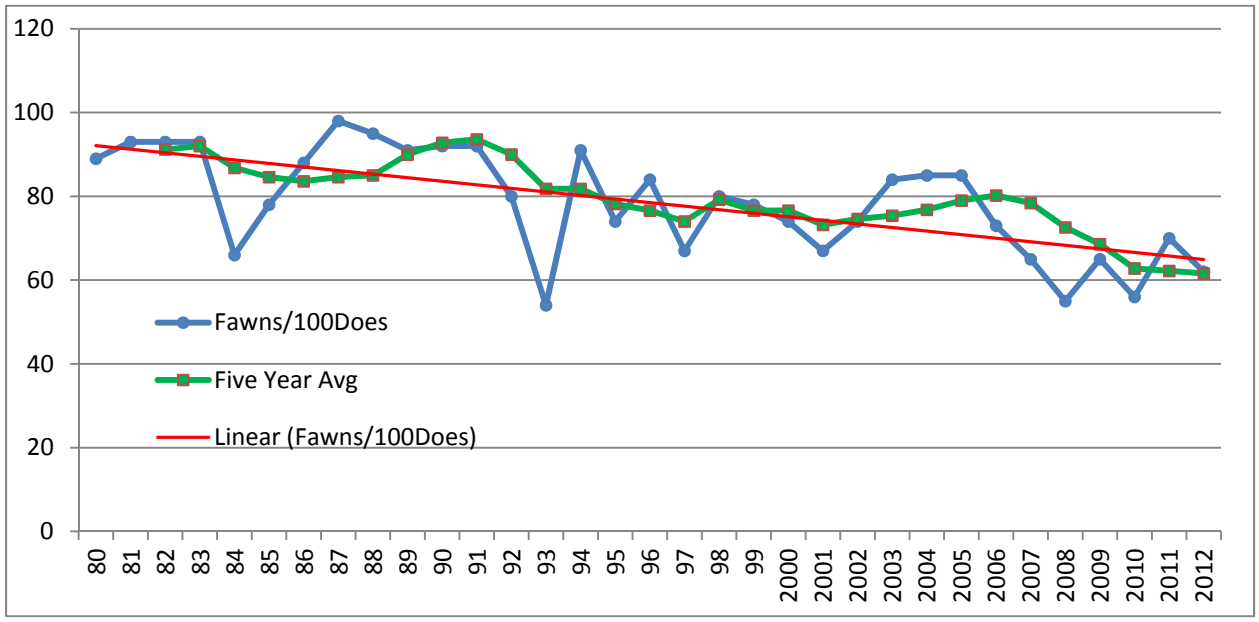


Figure 1: Observed Annual, and Recent Five-Year Average Fawn:Doe Ratios in the Cheyenne River Pronghorn herd unit (1980-2012).

As this population rose between 2002 and 2007, preseason buck:doe ratios fluctuated, but generally increased. Since 2007, preseason buck:doe ratios have declined. The population model simulates an increase in buck ratios from 46:100 in 2002 to a peak of 61:100 in 2007, with a subsequent decline back to 47:100. It should be noted the accuracy of the observed buck:doe ratio in both 2006 & 2007 was probably better than those observed between 2002 and 2005, when the observed ratio fluctuated between 45:100 and 65:100 annually. During the preceding decade, observed buck:doe ratios were much more consistent, and averaged about 53:100.

Small changes in female mortality rates can greatly affect observed male:female ratios (Bender 2006). Fluctuations in observed buck:doe ratios may have been influenced more by female survival than total buck numbers, at least in hunt areas where we have no difficulty increasing doe harvest, such as Areas 27 and portions of Areas 7 & 29. This may explain the wide variation in observed buck:doe ratios within the herd unit between some years. As Bender (2006) states, managers should consider the significant influence small changes in female mortality rates have on observed male:female ratios when managing male escapement from harvest in ungulate populations.

HARVEST DATA: Harvest success in this herd unit increased between 2002 and 2007 and effort declined as the population grew. In 2008, success again rose slightly, but effort increased as well. Since then, hunter success has dropped and effort has continued to increase. In 2012, several hunt areas exhibited low success and high effort compared to other pronghorn hunt areas in the state and within this herd unit. Hunt Areas 4, 5, 8, & 29 had an average active license success of 67% on doe/fawn tags, while type 1 active license success averaged 69% in areas 4, 5, & 27. Other hunt areas exhibited success values closer to those generally expected for pronghorn. Herd unit wide, active license success was just below 80% on doe/fawn tags and was about 85% with type 1 licenses. Although hunter success has dropped recently, the hunter satisfaction survey revealed herd unit-wide 40% of hunters were very satisfied and 37% were satisfied with their hunt last fall.

POPULATION: The 2012 post-season population estimate of this herd was about 31,000 with the population trending downwards, after peaking at an estimated 55,000 pronghorn in 2007. The last line transect (LT) survey conducted in this herd unit was in June 2011, and resulted in an end of 2010 bio-year population estimate of 30,900. Another LT is scheduled for June, 2013.

This population was generally stable and near objective between 1993 and 2002. The population then increased through 2007 as fawn survival was good, and observed preseason fawn:doe ratios averaged 80:100 from 2002 through 2006. This, coupled with our inability to sell all doe/fawn licenses, made controlling the population difficult. Since then, a reduction in price of doe/fawn licenses, the ability for hunters to possess up to four of them, internet license sales, and enrollment of private lands in our PLPW program have substantially improved doe/fawn harvest. This population has dropped steadily since 2007, in the wake of increased female harvest through 2009 and continued, lower fawn survival.

The "Time Specific Juvenile – Constant Adult Survival" (TSJ CA) spreadsheet model was chosen to estimate this herd's population. The three competing models considered had relatively similar AICc values and tracked observed trends in this population well. The TSJ CA model was chosen because it aligned better with recent LT estimates. It also produced a 2012 post-season population estimate between other competing models. All three models simulate a population rise between 2002 and 2007, followed by a decline. These trends dovetail well with harvest statistics and the perceptions of local game managers, landowners, and hunters. The current model is considered to be of good quality because it has 15^{+} years of data; ratio data are available for all years in the model; juvenile and adult survival data were obtained from similar herds; it aligns fairly well with observed data; and results are biologically defensible.

MANAGEMENT SUMMARY: The 2012 hunting season was conservative in this herd unit, and changes for the 2013 season entail fostering this strategy. We are continuing to reduce doe/fawn harvest in the central portion of the herd unit, where pronghorn numbers remain notably depressed. A relatively greater reduction in doe/fawn harvest is being carried forth in the northern two-thirds of Hunt Area 29, where landowners are complaining about low pronghorn numbers. Additionally, a new strategy is being implemented in Hunt Area 29 to reduce severe hunter crowding and over-harvest on the small portion of public land available, primarily Thunder Basin National Grasslands. This entails issuing a type 2 license valid on private land only, and restricting validity of type 6 tags to private land as well. In addition, harvest of bucks

is being reduced about 20% in area 27, an area where residents hold 80% of the licenses. Here, active type 1 license success has dropped below 80%, and the percentage of residents reporting they were satisfied or very satisfied fell from 89% in 2011 to 64% in 2012. Finally, in the southern third of the herd unit, harvest levels will remain steady to address damage issues near Lusk and south of Douglas.

Given average survival and recruitment rates observed over the past five years, together with a predicted harvest of 3,785 pronghorn, changes in the hunting season structure should allow this population to grow about 6%, to 33,100 post-season in 2013.

LITERATURE CITED:

Bender, Louis C. 2006. Uses of herd composition and age ratios in ungulate management. Wildlife Society Bulletin. Vol. 34 (4): 1225-1230.

INPUT	
Species:	Pronghorn
Biologist:	Joe Sandrini
Herd Unit & No.:	Cheyenne River
Model date:	02/14/12

☑ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	**Constant Juvenile & Adult Survival**	162	171	☐ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	126	152	☐ SCJ,SCA	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	68	173	☑ TSJ,CA Model	

Population Estimates from Top Model

Year	Predicted Prehunt Population (year *i*)			Total	Predicted Posthunt Population (year *i*)			Total	Predicted adult End-of-bio-year Pop (year *i*)			LT Population Estimate		Trend Count	Objective
	Juveniles	Total Males	Females		Juveniles	Total Males	Females		Total Males	Females	Total Adults	Field Est	Field SE		
1993	10884	12460	20094	**43438**	10720	9801	18799	**39319**	10152	18013	**28165**				38000
1994	16137	9949	17653	**43739**	15984	6679	16382	**39045**	9331	17900	**27231**				38000
1995	12990	9145	17542	**39676**	12681	5983	15785	**34449**	10330	18879	**29209**				38000
1996	15519	10124	18502	**44144**	15432	7002	17493	**39927**	9377	18633	**28010**				38000
1997	12275	9189	18260	**39724**	12203	6290	17307	**35800**	9255	18928	**28182**				38000
1998	14767	9070	18549	**42386**	14685	6504	17990	**39180**	10556	20636	**31192**				38000
1999	15772	10345	20224	**46341**	15660	7888	19532	**43079**	11245	21418	**32663**				38000
2000	15435	11020	20989	**47445**	15323	8399	20265	**43987**	9756	20140	**29897**				38000
2001	13172	9561	19737	**42471**	13079	7475	19250	**39803**	8613	18868	**27482**	25386	4403		38000
2002	13621	8441	18491	**40553**	13552	6182	18148	**37881**	11066	21538	**32604**				38000
2003	17781	10845	21107	**49733**	17647	8289	20317	**46253**	10142	20640	**30782**	26285	4595		38000
2004	17186	9939	20227	**47352**	17061	7235	19465	**43761**	13491	24190	**37681**				38000
2005	20098	13221	23706	**57025**	19941	10584	22802	**53327**	15342	25995	**41336**				38000
2006	18714	15035	25475	**59223**	18567	11820	24170	**54558**	17023	27818	**44840**				38000
2007	17656	16682	27261	**61599**	17406	12622	25063	**55091**	14406	25270	**39677**				38000
2008	13684	14118	24765	**52567**	13386	9896	22112	**45394**	13787	24409	**38196**	38196	4139		38000
2009	15635	13511	23921	**53067**	15236	9192	20917	**45345**	14018	24181	**38199**				38000
2010	13228	13738	23697	**50662**	12813	9764	20687	**43265**	10075	19497	**29572**	30919	4265		38000
2011	13384	9873	19107	**42364**	12989	6649	16932	**36570**	8278	17260	**25539**				38000
2012	10733	8113	16915	**35760**	10429	5349	15286	**31065**	9154	17915	**27069**				38000
2013	10757	8971	17557	**37284**	10509	6375	16237	**33120**							38000
2014															
2015															
2016															
2017															
2018															
2019															
2020															
2021															
2022															
2023															
2024															
2025															

Survival and Initial Population Estimates

Year	Annual Juvenile Survival Rates			Annual Adult Survival Rates		
	Model Est	Field Est	SE	Model Est	Field Est	SE
1993	0.43			0.83		
1994	0.52			0.83		
1995	0.90			0.83		
1996	0.51			0.83		
1997	0.71			0.83		
1998	0.73			0.83		
1999	0.63			0.83		
2000	0.40			0.83		
2001	0.40			0.83		
2002	0.90			0.83		
2003	0.40			0.83		
2004	0.90			0.83		
2005	0.67			0.83		
2006	0.80			0.83		
2007	0.50			0.83		
2008	0.90			0.83		
2009	0.90			0.83		
2010	0.40			0.83		
2011	0.40			0.83		
2012	0.90			0.83		
2013	0.00			0.83		
2014						
2015						
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

Parameters:	Optim cells
Adult Survival =	0.830
Initial Total Male Pop/10,000 =	1.246
Initial Female Pop/10,000 =	2.009

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult surviva	98%

	Classification Counts										Harvest	
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		54.16	1.24	62.01	62.01	1.36	2418	1178	149	3745	21.3	6.4
1994		91.41	2.09	56.36	56.36	1.48	2973	1155	139	4267	32.9	7.2
1995		74.05	1.75	52.13	51.52	1.36	2874	1597	281	4752	34.6	10.0
1996		83.88	2.37	54.72	55.73	1.78	2838	917	79	3834	30.8	5.5
1997		67.22	2.02	50.33	50.33	1.65	2636	866	65	3567	31.6	5.2
1998		79.61	2.30	48.90	48.89	1.64	2332	508	74	2914	28.3	3.0
1999		77.99	2.67	51.15	51.15	1.99	2234	629	102	2965	23.8	3.4
2000		73.54	2.75	52.50	54.81	2.24	2383	658	102	3143	23.8	3.4
2001		66.74	2.82	48.44	47.08	2.22	1897	443	85	2425	21.8	2.5
2002		73.66	2.79	45.65	44.77	1.99	2054	312	63	2429	26.8	1.9
2003		84.24	3.21	51.38	65.09	2.67	2324	718	122	3164	23.6	3.7
2004		84.96	2.82	49.14	41.93	1.73	2458	693	114	3265	27.2	3.8
2005		84.78	3.00	55.77	62.15	2.41	2397	822	143	3362	19.9	3.8
2006		73.46	2.39	59.02	59.02	2.05	2922	1186	133	4241	21.4	5.1
2007		64.76	2.25	61.19	61.20	2.17	3691	1999	227	5917	24.3	8.1
2008		55.25	1.71	57.01	57.02	1.74	3838	2412	271	6521	29.9	10.7
2009		65.36	1.98	56.48	54.26	1.74	3926	2731	363	7020	32.0	12.6
2010		55.82	1.93	57.97	62.47	2.08	3612	2736	377	6725	28.9	12.7
2011		70.04	2.58	51.67	50.28	2.05	2931	1978	359	5268	32.7	11.4
2012		63.45	2.62	47.96	43.89	2.04	2512	1481	1481	4269	34.1	9.6
2013		61.27	2.09	51.10	54.67	1.93	2360	1200	1200	3785	28.9	7.5
2014												
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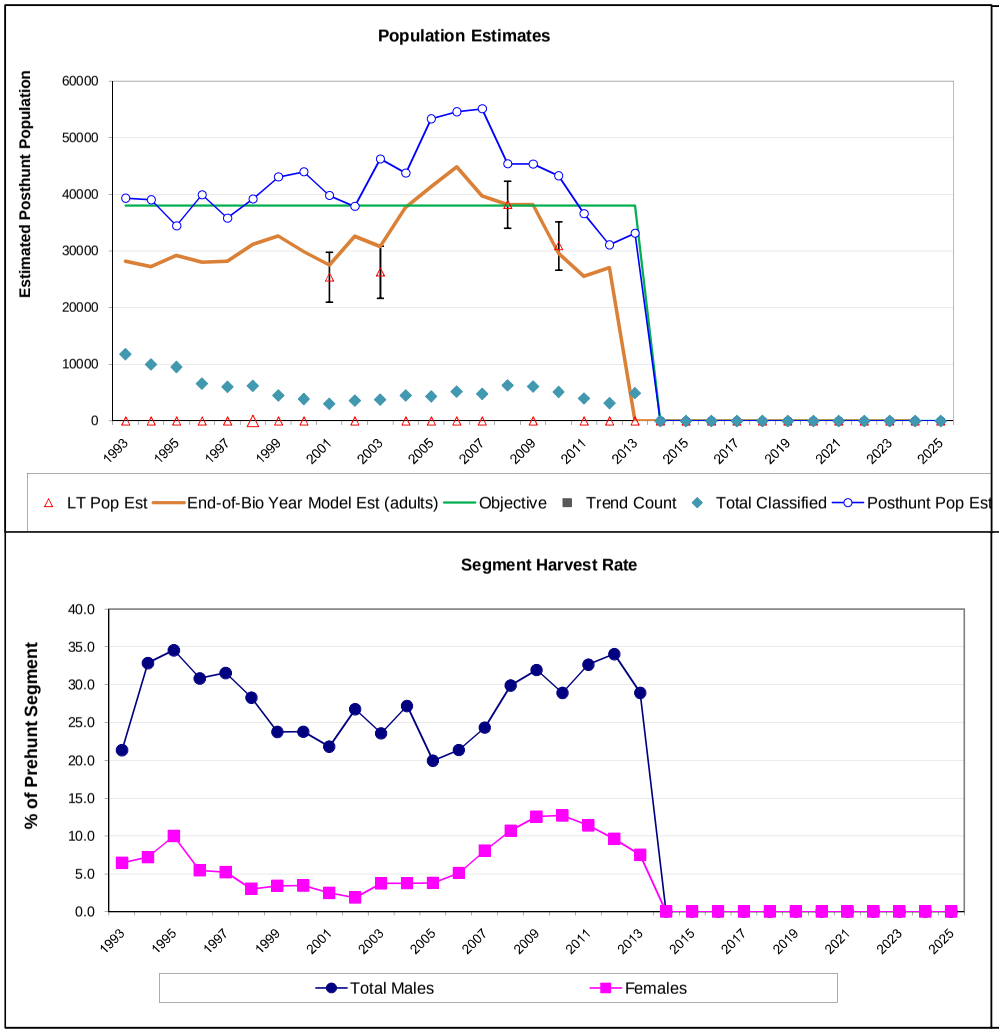
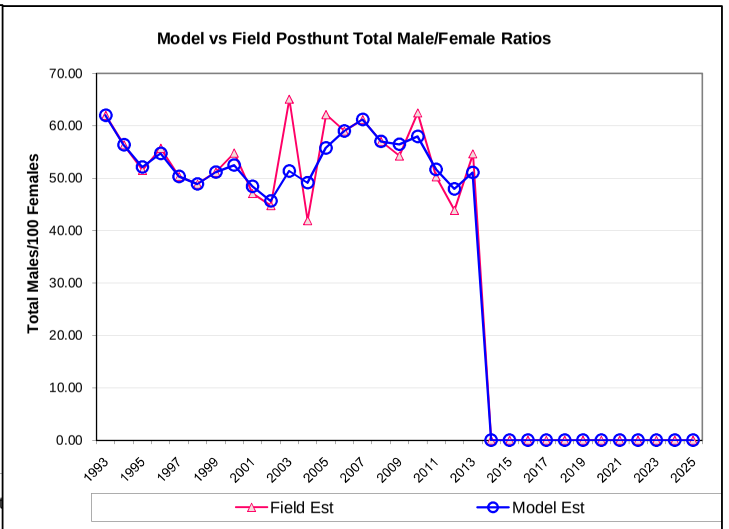
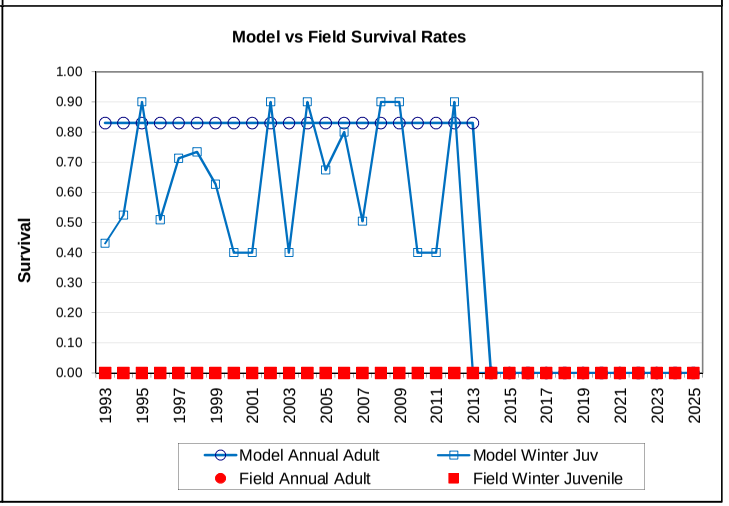
FIGURES







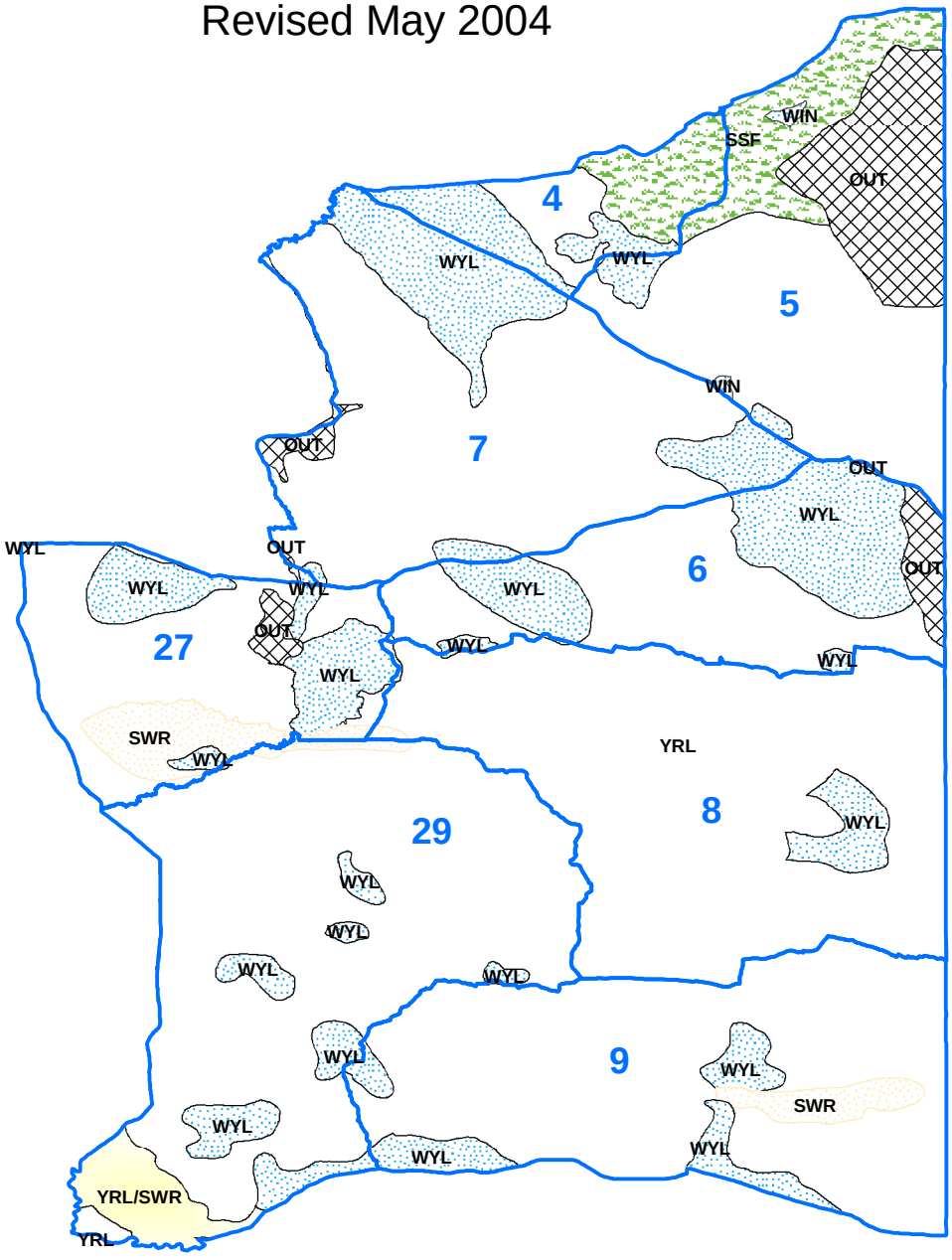
Comments:

Pronghorn - Cheyenne River

Hunt Areas 4, 5, 6, 7, 8, 9, 27, & 29

Casper Region

Revised May 2004



2012 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2012 - 5/31/2013

HERD: PR745 - RATTLESNAKE

HUNT AREAS: 70-72

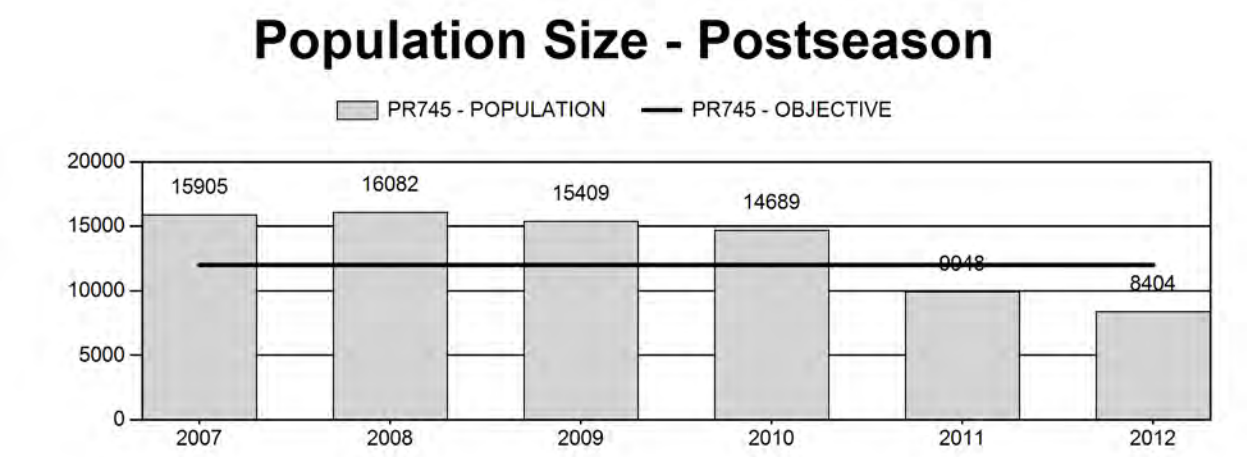
PREPARED BY: HEATHER O'BRIEN

	2007 - 2011 Average	2012	2013 Proposed
Population:	14,407	8,404	8,559
Harvest:	2,491	1,763	1,310
Hunters:	2,534	1,955	1,450
Hunter Success:	98%	90%	90%
Active Licenses:	2,755	2,154	1,500
Active License Percent:	90%	82%	87%
Recreation Days:	7,698	6,349	4,000
Days Per Animal:	3.1	3.6	3.1
Males per 100 Females	62	44	
Juveniles per 100 Females	54	43	

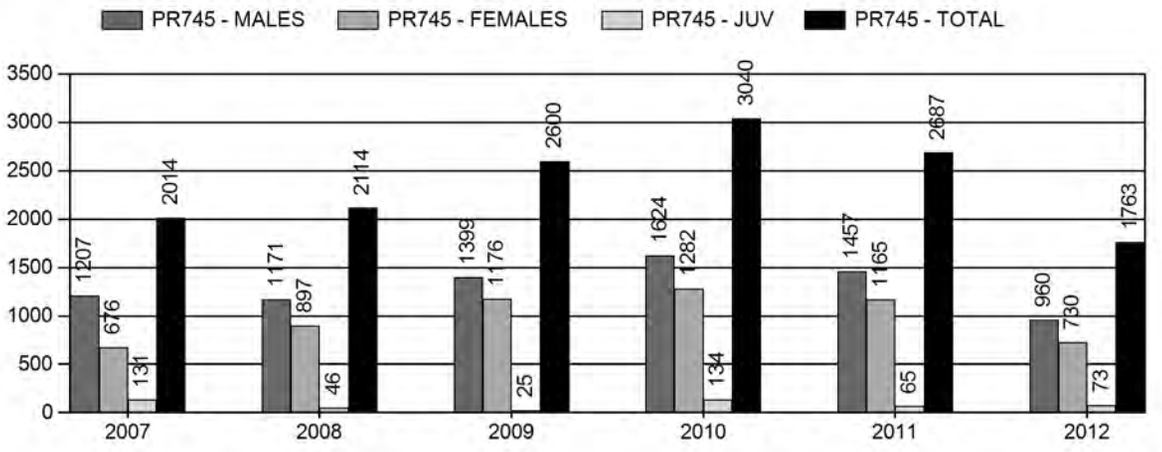
Population Objective:	12,000
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-30.0%
Number of years population has been + or - objective in recent trend:	2
Model Date:	2/28/2013

Proposed harvest rates (percent of pre-season estimate for each sex/age group):

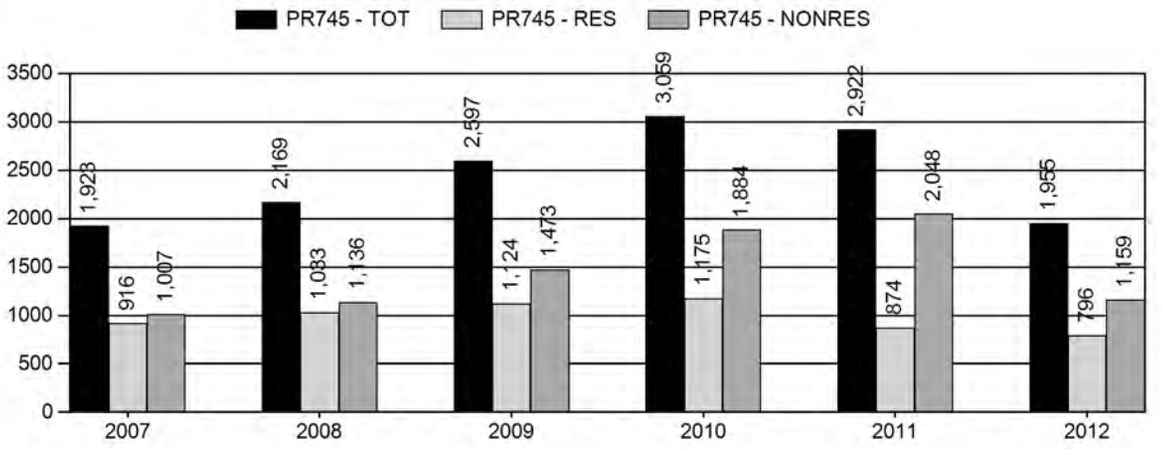
	JCR Year	Proposed
Females ≥ 1 year old:	14.8%	6.2%
Males ≥ 1 year old:	40.7%	31.0%
Juveniles (< 1 year old):	0.7%	1.7%
Total:	17.0%	10.2%
Proposed change in post-season population:	-18.7%	-11.2%



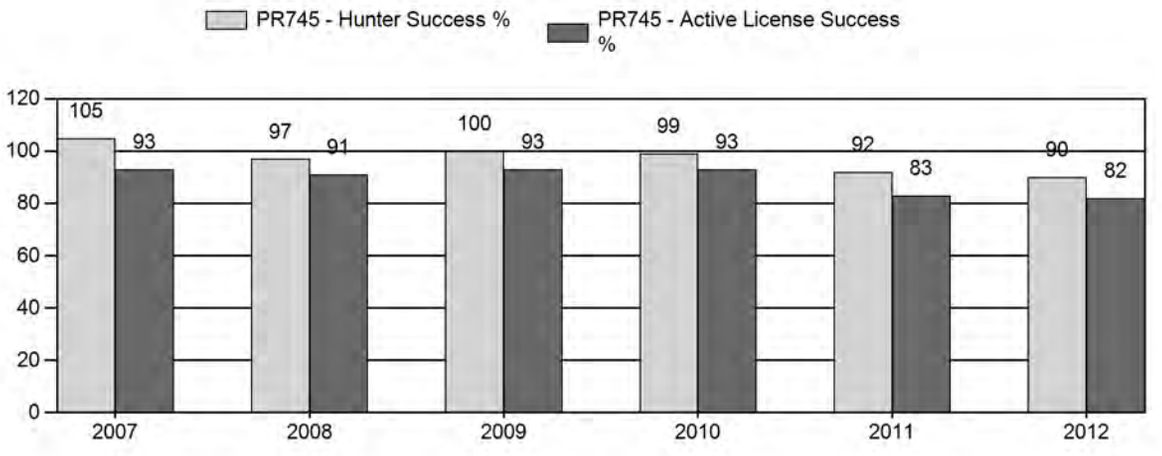
Harvest



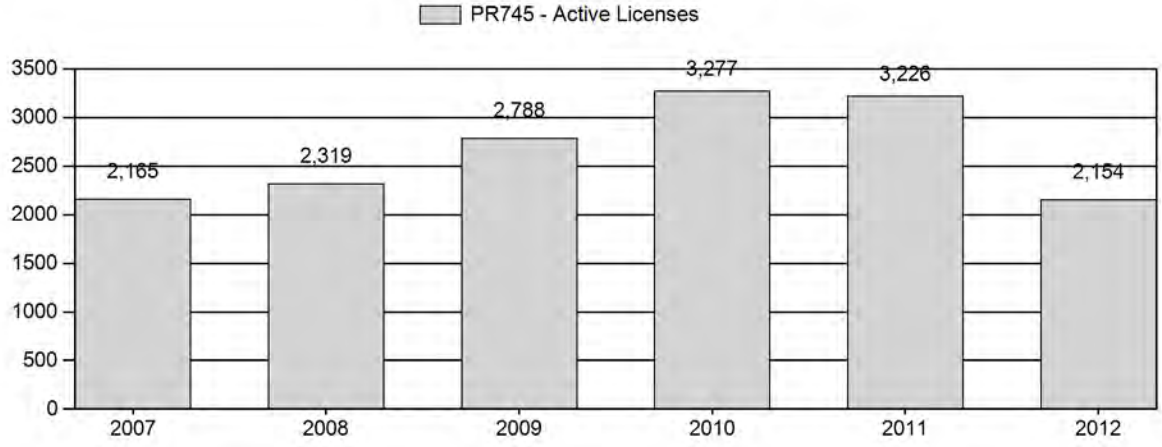
Number of Hunters



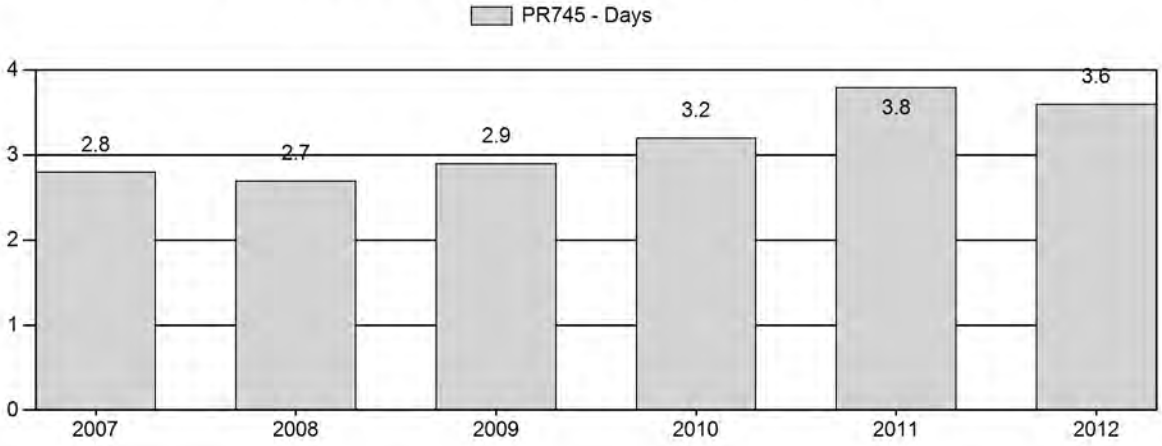
Harvest Success



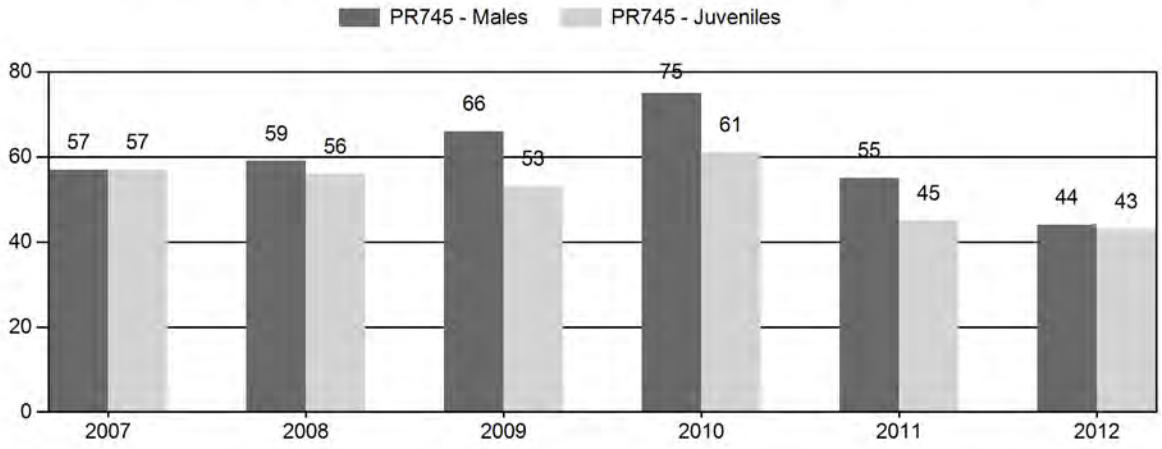
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2007 - 2012 Preseason Classification Summary

for Pronghorn Herd PR745 - RATTLESNAKE

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2007	18,120	381	663	1,044	27%	1,836	47%	1,050	27%	3,930	0	21	36	57	± 3	57	± 3	36
2008	18,407	434	823	1,257	28%	2,114	46%	1,183	26%	4,554	0	21	39	59	± 3	56	± 3	35
2009	18,269	330	954	1,284	30%	1,951	46%	1,027	24%	4,262	0	17	49	66	± 3	53	± 3	32
2010	18,033	271	933	1,204	32%	1,599	42%	970	26%	3,773	0	17	58	75	± 4	61	± 4	35
2011	12,938	195	683	878	27%	1,607	50%	721	22%	3,206	0	12	43	55	± 3	45	± 3	29
2012	10,343	82	209	291	24%	662	53%	285	23%	1,238	0	12	32	44	± 5	43	± 5	30

2013 HUNTING SEASONS
RATTLESNAKE PRONGHORN HERD (PR745)

Hunt Area	Type	Date of Seasons Opens	Closes	Quota	Limitations
70	1	Sept. 15	Oct. 31	200	Limited quota licenses; any antelope
	6	Sept. 15	Nov. 30	200	Limited quota licenses; doe or fawn antelope
71	1	Sept. 15	Oct. 31	200	Limited quota licenses; any antelope
	6	Sept. 15	Oct. 31	100	Limited quota licenses; doe or fawn antelope
72	1	Sept. 15	Oct. 31	600	Limited quota licenses; any antelope
	6	Sept.15	Oct. 31	200	Limited quota licenses; doe or fawn antelope
Archery		Aug. 15	Sept. 14		Refer to license type and limitations in Section 3

Hunt Area	Type	Quota change from 2012
70	1	0
	6	0
71	1	-100
	6	-200
72	1	-200
	6	-400
Total	1	-300
	6	-600

Management Evaluation

Current Postseason Population Management Objective: 12,000

Management Strategy: Special

2012 Postseason Population Estimate: ~8,400

2013 Proposed Postseason Population Estimate: ~8,600

The Rattlesnake Pronghorn Herd Unit has a post-season population management objective of 12,000 pronghorn. The herd is managed using the special management strategy, with a goal of maintaining preseason buck ratios between 60-70 bucks per 100 does. The objective and management strategy were last revised in 1988, and will be formally reviewed in 2014.

Herd Unit Issues

The 2012 post-season population estimate was approximately 8,300 and trending downward. This herd unit did not have a functional population model until 2012, when a spreadsheet-based modeling system replaced the program POP-II to simulate herd dynamics. Prior management decisions for this herd were made using a combination of classification data, harvest statistics, observations of field personnel, and comments from hunters and landowners regarding pronghorn numbers. Line transect surveys were also conducted in 1998, 2000, and 2003 to provide end-of-year population estimates. A subsequent line transect surveys conducted in 2007 was deemed unusable and discarded. An additional line transect survey is scheduled for May 2013. The current model is considered to be of fair quality, as personnel believe there to be significant interchange between the Rattlesnake and Beaver Rim Herd Units. For this reason, these two herd units are being combined into one herd unit in 2013.

Hunting access within the herd unit is moderate, with some large tracts of public land as well as walk-in areas and a hunter management area. Traditional ranching and grazing are the primary land use over the whole herd unit, with scattered areas of oil and gas development. Hunt Area 70 & 71 are dominated by private lands. License issuance is consistently maintained in Area 70 to address damage issues on irrigated agricultural fields. Periodic disease outbreaks (i.e. hemorrhagic diseases, *Clostridium spp*. infections) are possible in this herd and can contribute to population declines when environmental conditions are suitable.

Weather

The winter of 2011-2012 was mild with below average snow accumulations and relatively warm temperatures. The growing season of 2012 through early winter of 2013 was extremely dry with above average temperatures. During the same time period, available water, forage growth, and forage quality were below average. As a result, very poor fawn ratios of 43:100 does were observed during 2012 preseason classification surveys. Distribution of pronghorn within the herd unit shifted to those few areas where water and forage were available along drainages and near reservoirs. Several landowners discovered dead antelope in late summer near water. These mortalities were likely due to hemorrhagic disease, which was confirmed in many parts of Wyoming in 2012. Continued lack of quality forage over the winter of 2012-2013 could escalate pronghorn mortality in the spring of 2013, particularly if late snow accumulations create an additional stressor.

Habitat

This herd unit has no established habitat transects that measure production and/or utilization on shrub species that are preferred browse for pronghorn. Additionally, there are no comparable

habitat transects in neighboring herd units to reference. Anecdotal observations and discussions with landowners in the region indicate that summer and winter forage availability for pronghorn was very poor in 2012. Herbaceous forage species were observed to be in extremely poor condition, which likely contributed to diminished nutrition for lactating does and their fawns.

Field Data

Fawn ratios were high in this herd from 1998-2005, and the population grew markedly during this time period. However, license issuance was modest and the population grew above management control by harvest. Fawn ratios were moderate from 2006-2010, but pronghorn populations were already high by this time period. License issuance increased significantly every year from 2006-2011 in an attempt to curb high pronghorn numbers and reduce the herd toward objective. By 2011, environmental factors combined with low fawn ratios and high harvest pressure rapidly reduced this herd to near or below objective. Harsh winter conditions in 2010-11 combined with severe drought in 2012 have since dropped this herd unit below management objective. License issuance has thus become more conservative.

Buck ratios for the Rattlesnake Herd historically range from the mid 40s to mid 70s per 100 does. Buck ratios are most commonly in the upper 50s, just below the lower limit for special management. In more recent years, buck ratios have dropped to the mid-40s as a result of low fawn recruitment and high harvest pressure on a diminishing population. While it can be difficult to maintain this herd within the range of special management, hunters have developed high expectations for buck numbers and quality within this herd. Managers thus plan to manage pronghorn so as to improve and maintain the buck ratio within special management parameters.

Harvest Data

License success in this herd unit is typically in the 90th percentile. Success declined the last two years to the low end of that range and days per animal increased, indicating pronghorn were more difficult for hunters to find and harvest. Despite drastic reductions in license numbers in 2012, license success and hunter days remained mediocre, and many hunters remarked that bucks were more difficult to find and of lower quality. Given suppressed fawn production and declining buck ratios, managers recommend further license reductions in 2013 with the goal of improving buck ratios and population numbers overall.

Population

The 2012 post-season population estimate was approximately 8,300 and trending downward. This herd unit did not have a functional population model until 2012, when a spreadsheet-based modeling system replaced the program POP-II to simulate herd dynamics. Prior management

decisions for this herd were made using a combination of classification data, harvest statistics, observations of field personnel, and comments from hunters and landowners regarding pronghorn numbers. Line transect surveys were also conducted in 1998, 2000, and 2003 to provide end-of-year population estimates. A subsequent line transect survey conducted in 2007 was deemed unusable and discarded. Personnel believe there to be significant interchange between the Rattlesnake and Beaver Rim Herd Units. For this reason, these two herd units may be combined into one herd unit in 2013-2014.

The "Time-Specific Juvenile Survival – Constant Adult Survival" (TSJ,CA) spreadsheet model was chosen for the post-season population estimate of this herd. This model seemed most representative of the herd, as it selects for low juvenile survival in the years when managers agree that overwinter fawn survival was very poor – particularly in 2010 and 2011. The simpler models (CJ,CA and SCA,CA) select for higher juvenile survival rates across years, which does not seem feasible for this herd. All three models follow a trend that is plausible; however the CJ,CA model shows an extremely high buck harvest percentage in 2011, and the SCA,CA model shows a 2006 population peak that seems unrealistic. None of the three models track well with the three line transect estimates, but rather track in between them. While the AIC for the TSJ,CA model is the highest of the three, it is only due to year-by-year penalties on juvenile survival and is still well within one level of power in comparison to the AICs of the simpler models. The TSJ, CA model appears to be the best representation relative to the perceptions of managers on the ground and follows trends with license issuance and harvest success. Overall the model is considered fair in quality as a representation of herd dynamics.

Management Summary

Traditional season dates in this herd run from September 15th through October 31st, and through November 30th for Area 70 Type 6 licenses. The same season dates will be applied for 2013, with a reduction of licenses in lieu of poor fawn ratios and declining buck ratios. The 2013 season includes a total of 1,000 Type 1 and 700 Type 6 licenses. While fawn ratios and population trend has declined in recent years, habitat conditions are also poor due to recent drought. Goals for 2013 are to improve antelope numbers gradually back towards objective while giving time for habitats to recover, improve buck ratios, and increase hunter success.

If we attain the projected harvest of 1,310 pronghorn with fawn ratios similar to the last few years, this herd will increase slightly in number. The predicted 2013 post-season population size for the Rattlesnake Pronghorn Herd is approximately 8,600 animals.

INPUT	
Species:	Pronghorn
Biologist:	Heather O'Brien
Herd Unit & No.:	PR745 Rattlesnakes
Model date:	02/28/13

☐ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	**Constant Juvenile & Adult Survival**	136	145	☐ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	134	145	☐ SCJ,SCA Mod	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	69	177	☐ TSJ,CA Model	

Population Estimates from Top Model

Year	Predicted Prehunt Population (year *i*)			Total	Predicted Posthunt Population (year *i*)			Total	Predicted adult End-of-bio-year Pop (year *i*)			LT Population Estimate		Trend Count	Objective
	Juveniles	Total Males	Females		Juveniles	Total Males	Females		Total Males	Females	Total Adults	Field Est	Field SE		
1993	2266	2169	4063	**8498**	2132	1331	3271	**6733**	2038	3764	**5802**				12000
1994	2804	1998	3689	**8490**	2774	1503	3491	**7768**	1874	3675	**5549**				12000
1995	2447	1836	3602	**7885**	2430	1329	3445	**7204**	2224	4147	**6371**				12000
1996	3590	2180	4064	**9833**	3577	1767	3881	**9226**	3153	5057	**8209**				12000
1997	3986	3090	4955	**12031**	3956	2551	4759	**11265**	3887	5889	**9776**				12000
1998	4074	3809	5771	**13654**	4039	2975	5470	**12483**	3338	5620	**8957**	7272	1152		12000
1999	3630	3271	5507	**12408**	3577	2082	5118	**10777**	2896	5694	**8590**				12000
2000	3819	2838	5580	**12237**	3774	1986	5312	**11072**	3375	6402	**9777**	12708	2202		12000
2001	4567	3308	6274	**14149**	4545	2874	6183	**13602**	3410	6387	**9797**				12000
2002	4114	3341	6259	**13714**	4101	2779	6101	**12981**	3220	6217	**9437**	7357	1396		12000
2003	4618	3156	6093	**13867**	4584	2467	5831	**12882**	4197	7235	**11432**				12000
2004	6724	4113	7090	**17927**	6701	3347	6693	**16741**	5073	8087	**13161**				12000
2005	6454	4972	7926	**19352**	6408	4142	7567	**18117**	4853	7950	**12803**				12000
2006	5147	4756	7791	**17694**	5081	3768	7257	**16106**	5262	8415	**13677**				12000
2007	4716	5157	8247	**18120**	4572	3830	7503	**15905**	5307	8640	**13947**				12000
2008	4739	5201	8468	**18407**	4688	3913	7481	**16082**	5444	8646	**14090**				12000
2009	4460	5335	8473	**18269**	4433	3796	7180	**15409**	5191	8222	**13413**				12000
2010	4888	5087	8058	**18033**	4741	3301	6647	**14689**	3607	6623	**10230**				12000
2011	2912	3535	6491	**12938**	2838	1936	5174	**9948**	2649	5526	**8175**				12000
2012	2331	2596	5416	**10343**	2251	1540	4613	**8404**	2473	5364	**7837**				12000
2013	2319	2424	5257	**10000**	2253	1544	4762	**8559**							12000
2014															12000
2015															12000
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Survival and Initial Population Estimates

Year	Annual Juvenile Survival Rates			Annual Adult Survival Rates		
	Model Est	Field Est	SE	Model Est	Field Est	SE
1993	0.90			0.87		
1994	0.44			0.87		
1995	0.90			0.87		
1996	0.90			0.87		
1997	0.84			0.87		
1998	0.40			0.87		
1999	0.67			0.87		
2000	0.90			0.87		
2001	0.40			0.87		
2002	0.40			0.87		
2003	0.90			0.87		
2004	0.65			0.87		
2005	0.40			0.87		
2006	0.80			0.87		
2007	0.90			0.87		
2008	0.90			0.87		
2009	0.90			0.87		
2010	0.40			0.87		
2011	0.40			0.87		
2012	0.90			0.87		
2013	0.40			0.87		
2014						
2015						
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Parameters:	Optim cells
Adult Survival =	0.868
Initial Total Male Pop/10,000 =	0.217
Initial Female Pop/10,000 =	0.406

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult survival	98%

	Classification Counts										Harvest	
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Males	Females	Juveniles	Total Harvest	Total Males	Females
1993		55.76	2.26	53.38	53.18	2.19	762	720	122	1604	38.6	19.5
1994		76.02	3.24	54.16	54.39	2.57	450	180	27	657	24.8	5.4
1995		67.95	2.80	50.98	48.04	2.21	461	142	16	619	27.6	4.3
1996		88.33	3.84	53.64	58.71	2.87	375	166	11	552	18.9	4.5
1997		80.43	4.31	62.35	62.28	3.59	490	179	27	696	17.4	4.0
1998		70.59	3.23	66.00	76.38	3.41	758	274	32	1064	21.9	5.2
1999		65.92	3.02	59.39	56.77	2.72	1081	354	48	1483	36.4	7.1
2000		68.44	3.65	50.86	47.98	2.86	775	243	41	1059	30.0	4.8
2001		72.80	3.84	52.72	55.80	3.19	394	83	20	497	13.1	1.5
2002		65.73	2.96	53.39	53.63	2.58	511	144	12	667	16.8	2.5
2003		75.80	3.35	51.79	47.39	2.42	626	238	31	895	21.8	4.3
2004		94.84	4.51	58.01	70.99	3.65	696	361	21	1078	18.6	5.6
2005		81.44	2.96	62.73	65.18	2.53	754	326	42	1122	16.7	4.5
2006		66.06	2.95	61.04	58.47	2.71	898	486	60	1444	20.8	6.9
2007		57.19	2.21	62.54	56.86	2.20	1207	676	131	2014	25.7	9.0
2008		55.96	2.03	61.42	59.46	2.12	1171	897	46	2114	24.8	11.7
2009		52.64	2.03	62.96	65.81	2.37	1399	1176	25	2600	28.8	15.3
2010		60.66	2.47	63.14	75.30	2.87	1624	1282	134	3040	35.1	17.5
2011		44.87	2.01	54.46	54.64	2.29	1454	1197	67	2718	45.2	20.3
2012		43.05	3.05	47.94	43.96	3.09	960	730	73	1763	40.7	14.8
2013		44.12	3.06	46.10	46.32	3.16	800	450	60	1310	36.3	9.4
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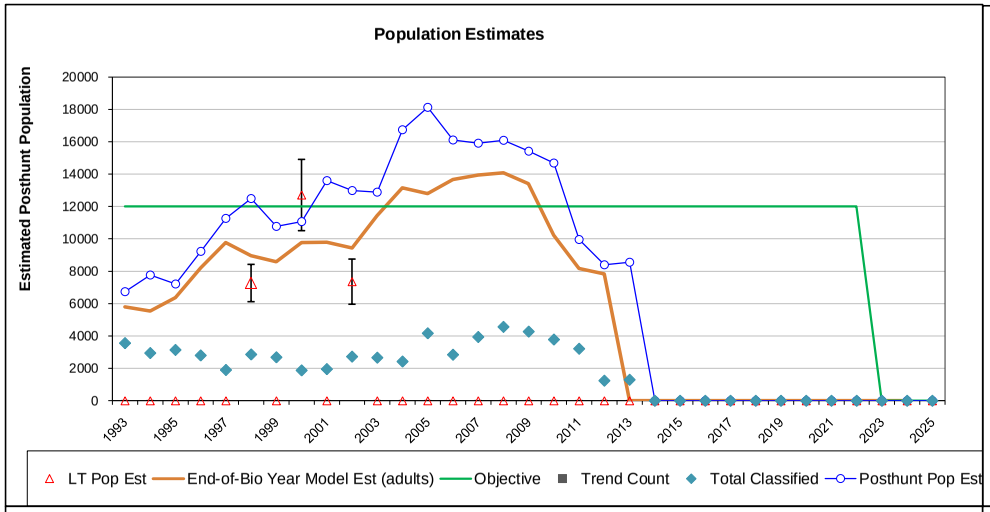
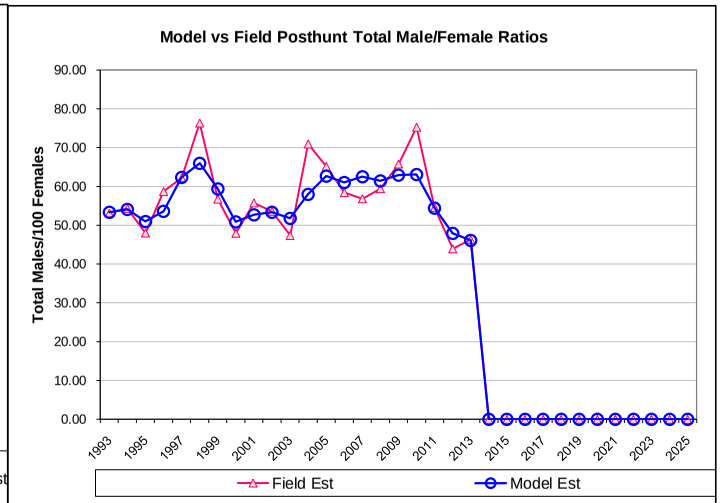
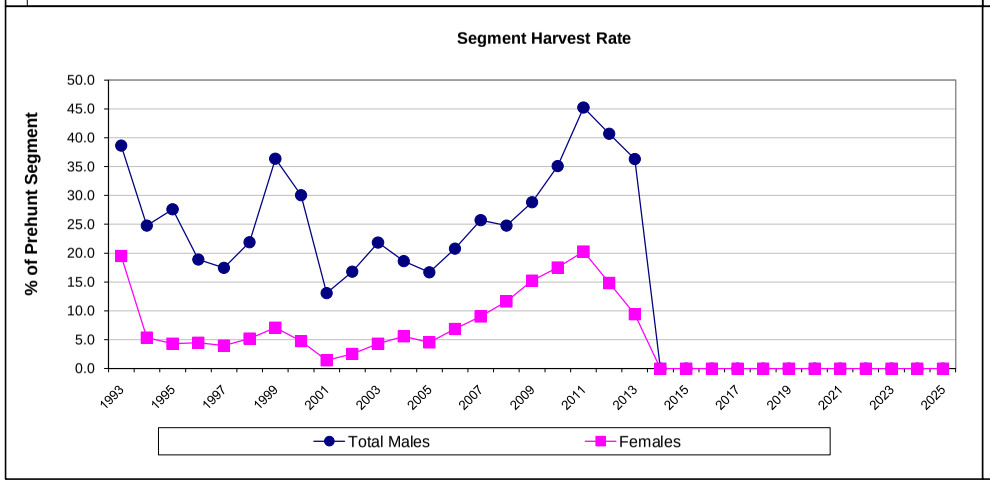
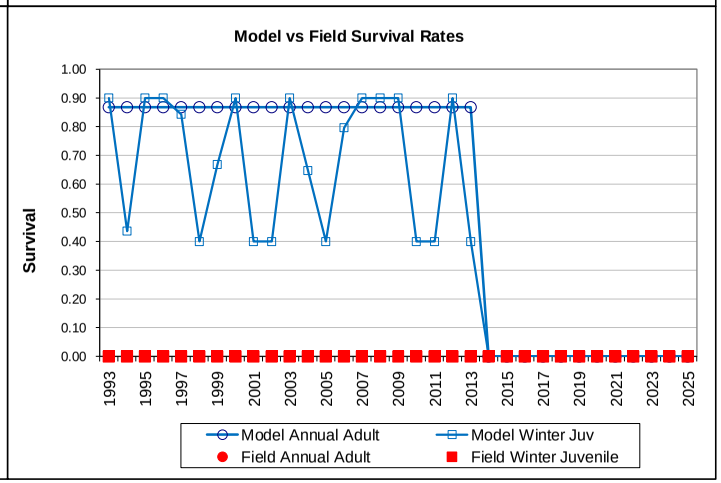
FIGURES









Comments:

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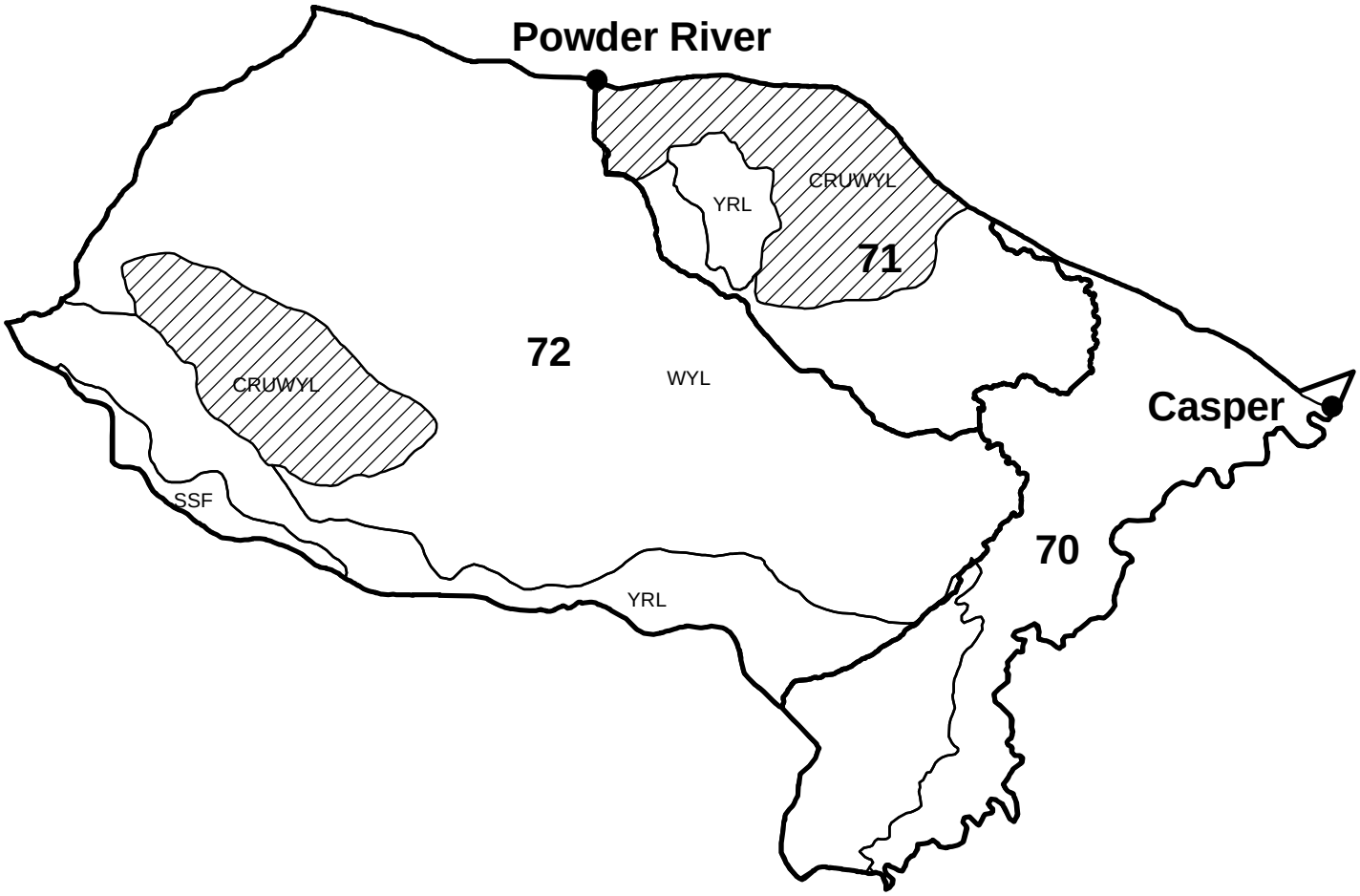
Antelope - Rattlesnake
Hunt Areas 70,71,72
Casper Region
Revised 4/88



2012 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2012 - 5/31/2013

HERD: PR746 - NORTH NATRONA

HUNT AREAS: 73

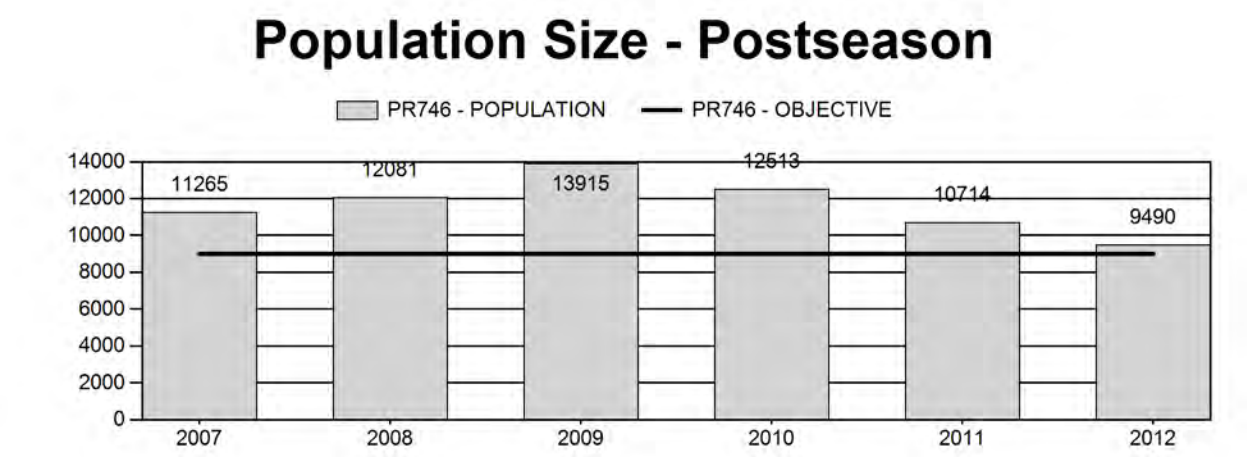
PREPARED BY: HEATHER O'BRIEN

	2007 - 2011 Average	2012	2013 Proposed
Population:	12,098	9,490	9,311
Harvest:	991	990	825
Hunters:	1,123	1,119	900
Hunter Success:	88%	88%	92%
Active Licenses:	1,176	1,185	950
Active License Percent:	84%	84%	87%
Recreation Days:	3,235	3,901	2,700
Days Per Animal:	3.3	3.9	3.3
Males per 100 Females	60	44	
Juveniles per 100 Females	54	46	

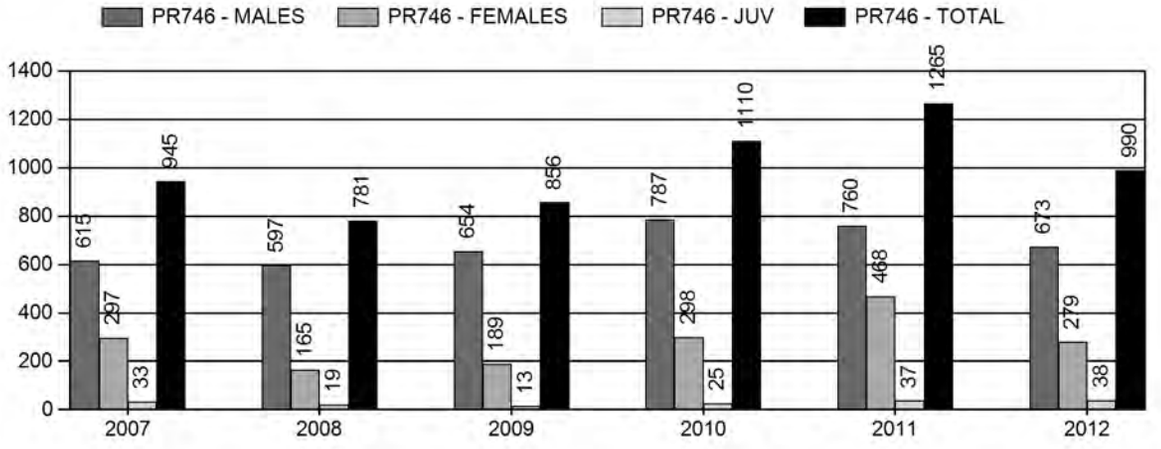
Population Objective:	9,000
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	5%
Number of years population has been + or - objective in recent trend:	15
Model Date:	2/28/2013

Proposed harvest rates (percent of pre-season estimate for each sex/age group):

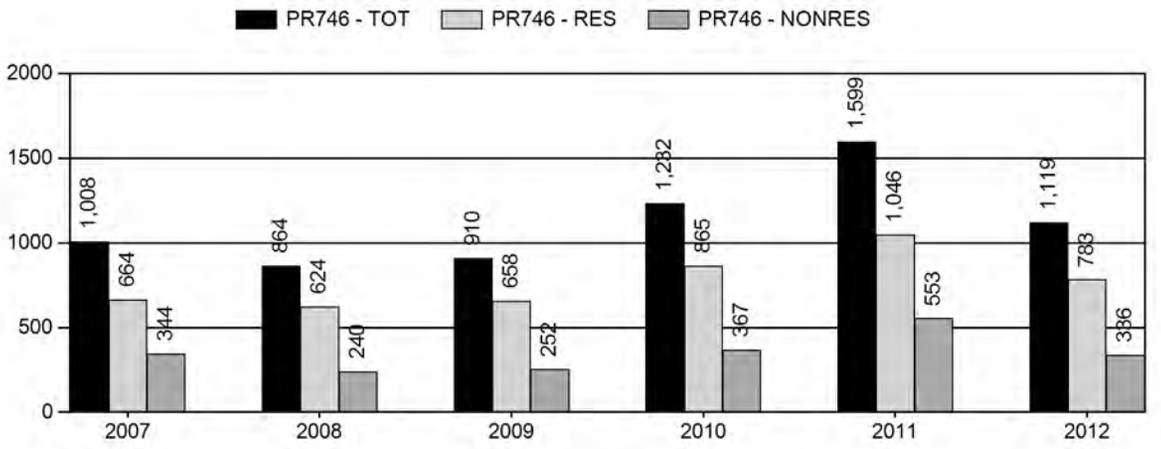
	JCR Year	Proposed
Females ≥ 1 year old:	7.9%	5.3%
Males ≥ 1 year old:	25.4%	30.3%
Juveniles (< 1 year old):	.7%	.01%
Total:	10.27%	8.96%
Proposed change in post-season population:	-10.5%	-7.9%



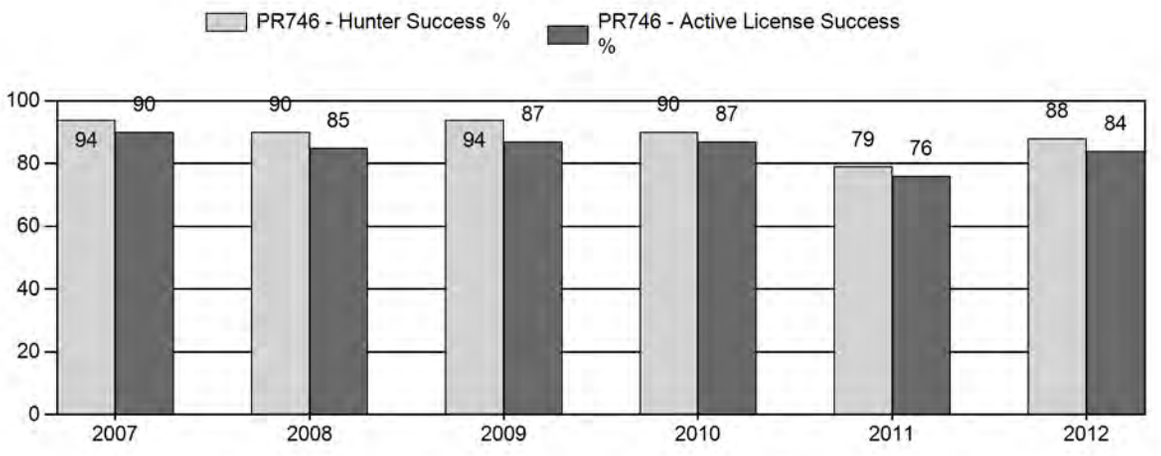
Harvest



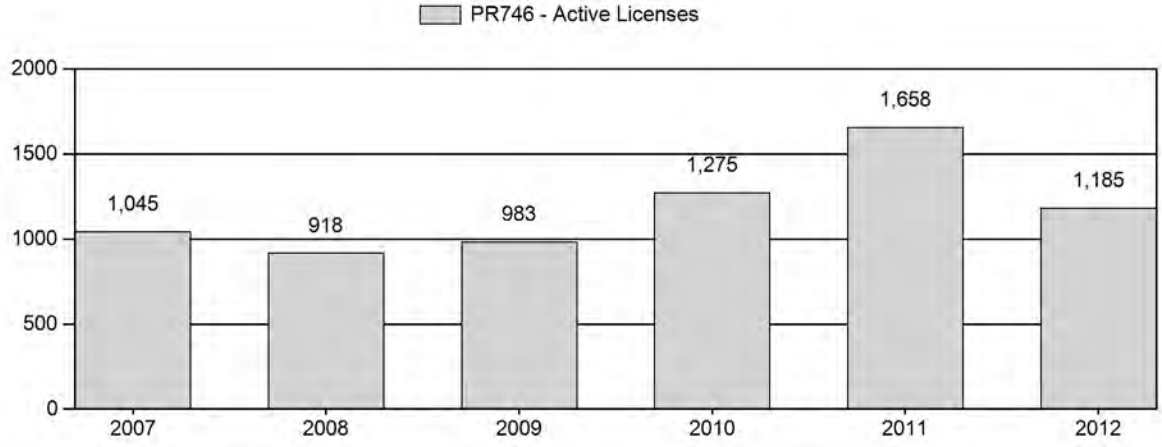
Number of Hunters



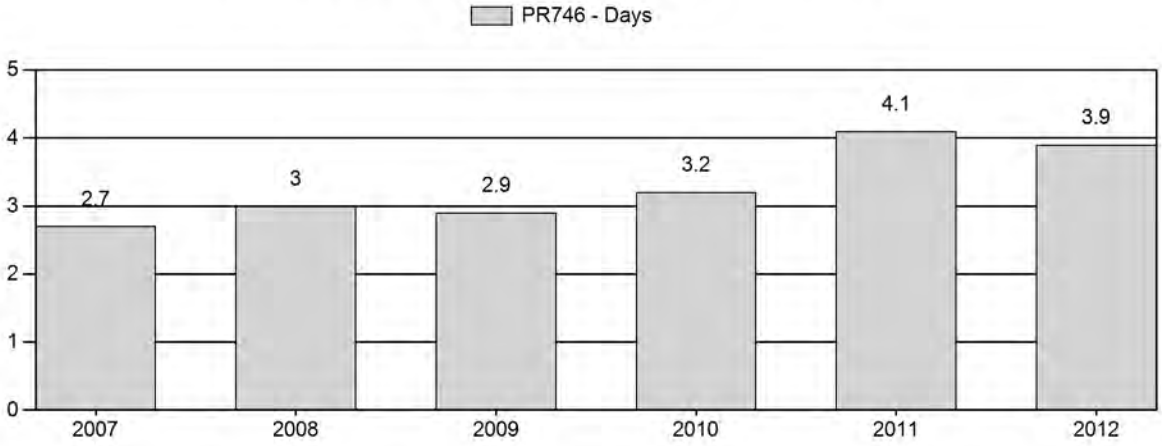
Harvest Success



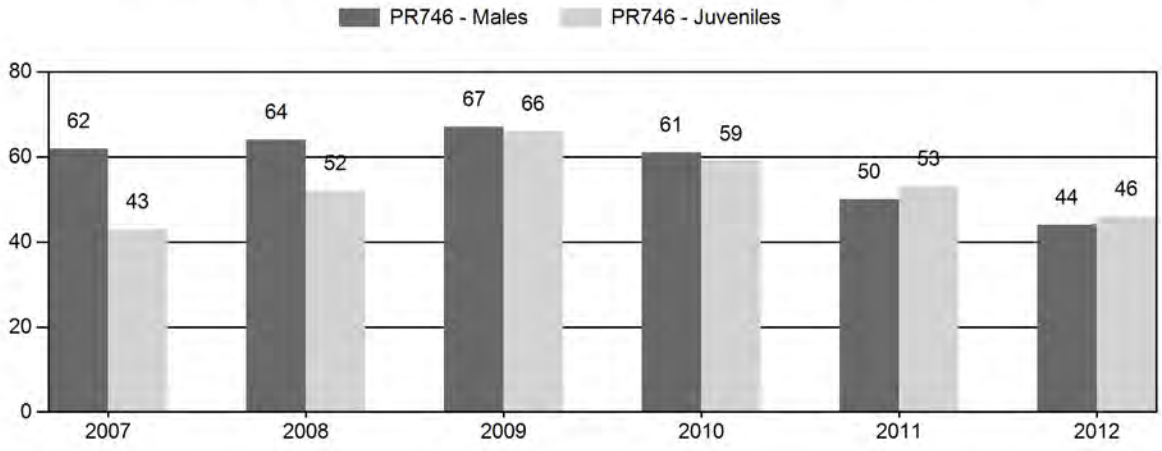
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2007 - 2012 Preseason Classification Summary

for Pronghorn Herd PR746 - NORTH NATRONA

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2007	12,305	368	547	915	30%	1,485	49%	637	21%	3,037	1,804	25	37	62	± 4	43	± 3	27
2008	12,940	245	380	625	30%	972	46%	508	24%	2,105	2,056	25	39	64	± 5	52	± 4	32
2009	14,856	273	541	814	29%	1,218	43%	809	28%	2,841	2,361	22	44	67	± 4	66	± 4	40
2010	13,734	172	392	564	28%	932	46%	552	27%	2,048	1,988	18	42	61	± 5	59	± 5	37
2011	12,124	119	540	659	25%	1,322	49%	697	26%	2,678	2,129	9	41	50	± 3	53	± 4	35
2012	10,579	127	190	317	23%	713	53%	327	24%	1,357	1,843	18	27	44	± 5	46	± 5	32

2013 HUNTING SEASONS
NORTH NATRONA PRONGHORN HERD (PR746)

Hunt Area	Type	Date of Seasons Opens	Closes	Quota	Limitations
73	1	Sept. 15	Oct. 31	800	Limited quota; any antelope
	6	Sept. 15	Oct. 31	100	Limited quota; doe or fawn antelope
	7	Sept. 15	Oct. 31	100	Limited quota; doe or fawn antelope valid on private land east of the Bucknum Rd (Natrona County Road 125) within the Casper Creek drainage
Archery		Aug. 15	Sept. 14		Refer to license type and limitations in Section 3

Hunt Area	Type	Quota change from 2012
73	1	-100
	6	-100
	7	-100

Management Evaluation

Current Postseason Population Management Objective: ~ 9,000
Management Strategy: Recreational
2012 Postseason Population Estimate: ~ 9,500
2013 Proposed Postseason Population Estimate: ~ 9,300

The North Natrona Herd unit has a post-season population management objective of 9,000 pronghorn. The herd is managed using the recreational management strategy, with a goal of maintaining preseason buck ratios between 30-59 bucks per 100 does. The objective and management strategy were last revised in 1987, and will be formally reviewed in 2014.

Herd Unit Issues

Hunting access within the herd unit is very good, with large tracts of public lands as well as walk-in areas available for hunting. The southeastern corner of the herd unit is the only area dominated by private lands. In this area, specific doe/fawn licenses have been added to address damage issues on irrigated agricultural fields. The main land use within the herd unit is traditional ranching and grazing of livestock. Industrial scale developments, including oil and gas development, are limited and isolated within this herd unit. Periodic disease outbreaks (i.e. hemorrhagic diseases, *Clostridium spp*. infections) can impact this herd and contribute to population declines when environmental conditions are suitable.

Weather

The winter of 2011-2012 was mild with below average snow accumulations and relatively warm temperatures. The growing season of 2012 through early winter of 2013 were extremely dry with above average temperatures. During the same time period, available water, forage growth, and forage quality were below average. As a result, very poor fawn ratios of 46:100 were observed during 2012 preseason classification surveys. The continued lack of quality forage in the winter of 2012-2013 could result in increased pronghorn mortality in spring of 2013, particularly if late snow accumulations create an additional stressor.

Habitat

This herd unit has no established habitat transects that measure production and/or utilization on shrub species that are preferred browse for pronghorn. Additionally, there are no comparable habitat transects in neighboring herd units to reference. Anecdotal observations and shrub monitoring for other big game species showed summer and winter forage availabilit for pronghorn to be very poor in 2012, with the possible exception of areas at higher elevations within this herd unit. Herbaceous forage species also were observed to be in poor condition, which likely contributed to diminished nutrition for lactating does and their fawns.

Field Data

Fawn ratios were high in this herd from 2002-2005, and the population grew markedly during this time period. Fawn ratios were moderate to poor from 2006-2012, but the population continued to grow through 2009 as license issuance did not keep pace with herd growth. In 2010-2011, license issuance increased sharply to address high antelope numbers and reduce the herd toward objective. By 2012, higher license issuance was no longer necessary to control growth of the herd, and licenses were reduced. Hunter harvest, mortality from harsh winter conditions in 2010-2011, extremely poor fawn production/survival, and severe drought in 2012 has subsequently reduced this herd.

Buck ratios for the North Natrona Herd historically average in the mid-50s per 100 does, though they exceeded recreational limits from 2007-2010, when ratios were in the 60s. Since then, buck ratios have dropped markedly each year along with the population as a whole, reaching a 15-year low of 44 bucks per hundred does in 2012. While this is still well within the targeted range for recreational management, hunters have developed higher expectations for buck numbers and quality within this herd. Managers thus plan to strive toward the upper range of recreational management with the goal of maintaining buck ratios in the 50s.

Harvest Data

License success in this herd unit is typically in the 80-90th percentile, with the exception of 2011 when license issuance remained high while the population declined. Hunter days reached a 15-year high in 2011 as well; further validating the aforementioned trend. In 2012, license issuance was cut in accordance with estimated population size, diminishing buck ratios, decreased harvest success, and increased harvest days. As a result, license success and hunter days improved in 2012, and the population estimate seemed relatively stable around the objective of 9,000 animals.

Population

The 2012 post-season population estimate was approximately 9,500 and trending downward from an estimated high of 14,000 pronghorn in 2009. The last line transect in this herd unit in 2003 resulted in an estimated end-of-year population of 8,500 pronghorn, with a standard error of about 1,000. An additional line transect survey will be conducted in May 2013 to further refine the population model.

The "Time-Specific Juvenile Survival - Constant Adult Survival" (TSJ,CA) spreadsheet model was chosen to use for the post-season population estimate of this herd. This model seemed the most representative of the herd, as it selects for higher juvenile survival during the years when field personnel observed more favorable environmental and habitat conditions, particularly from 2003-2008. The simpler models (CJ,CA and SCJ,CA) select for a very low juvenile survival rate across years, which does not seem feasible for this herd. All three models follow a trend that seems representative for this herd unit, and all three models align with two of the three line transect population estimates. However, the CJ,CA and SCJ,CA models estimate population peaks in 2009 that do not seem realistic compared to the perceptions of field personnel and landowners at that time. While the AIC for the TSJ,CA model is the highest of the three, it is only due to year-by-year penalties and is still well within one level of power in comparison to the AICs of the simpler models. Overall the model is considered to be fair in representing dynamics of the herd. The TSJ, CA model aligns with two of three line transect estimates, appears to be the best representation relative to the perceptions of managers on the ground, and follows trends with license issuance and harvest success.

Management Summary

Traditional season dates in this herd run from September 15th through October 31st. Season dates will remain the same for 2013, with a reduction of licenses to compensate for poor fawn ratios and declining buck ratios. The 2013 season includes 800 Type 1 licenses, 100 Type 6 licenses, and 100 Type 7 licenses. Type 7 licenses are adjusted accordingly with available access from year to year, and access is predicted to be similar to 2012 in 2013. While fawn ratios and

population growth rates have been poor in recent years, habitat conditions are now poor due to recent drought. Goals for 2013 are to maintain pronghorn numbers near objective, improve the buck ratio, and increase hunter success.

If we attain the projected harvest of 825 with fawn ratios similar to the last few years, this herd will maintain itself near objective. The predicted 2013 post-season population size of the North Natrona Pronghorn Herd is approximately 9,300 animals.

INPUT	
Species:	Pronghorn
Biologist:	Heather Obrien
Herd Unit & No.:	North Natrona
Model date:	02/28/13

☐ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	**Constant Juvenile & Adult Survival**	101	110	☐ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	101	110	☐ SCJ,SCA Mod	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	39	147	☐ TSJ,CA Model	

Population Estimates from Top Model

Year	Predicted Prehunt Population (year *i*)			Total	Predicted Posthunt Population (year *i*)			Total	Predicted adult End-of-bio-year Pop (year *i*)			LT Population Estimate		Trend Count	Objective
	Juveniles	Total Males	Females		Juveniles	Total Males	Females		Total Males	Females	Total Adults	Field Est	Field SE		
1993	2477	2151	3920	**8548**	2410	1438	3389	**7238**	2291	4053	**6344**				9000
1994	3192	2245	3972	**9409**	3171	1816	3864	**8851**	2388	4253	**6641**				9000
1995	3003	2340	4168	**9512**	2991	1930	4079	**9000**	2272	4227	**6499**				9000
1996	4103	2227	4143	**10473**	4092	1824	3985	**9902**	2404	4360	**6764**				9000
1997	2382	2356	4273	**9010**	2358	1930	4138	**8425**	2468	4471	**6939**				9000
1998	4106	2418	4382	**10906**	4079	1961	4242	**10282**	2511	4584	**7095**	5485	995		9000
1999	3044	2461	4492	**9997**	3033	2041	4366	**9440**	2543	4652	**7195**				9000
2000	3427	2492	4559	**10478**	3413	2038	4410	**9862**	2523	4675	**7197**	8211	1412		9000
2001	3015	2472	4581	**10068**	2978	2151	4477	**9606**	2470	4569	**7040**				9000
2002	3202	2421	4478	**10101**	3193	1981	4301	**9475**	2356	4456	**6811**				9000
2003	3289	2309	4367	**9964**	3276	1848	4180	**9304**	2852	4964	**7817**	8514	1020		9000
2004	4082	2795	4865	**11743**	4031	2230	4663	**10923**	3015	5229	**8244**				9000
2005	4352	2955	5124	**12431**	4320	2312	4892	**11523**	3536	5887	**9423**				9000
2006	3035	3465	5769	**12269**	3016	2792	5395	**11204**	3783	6140	**9922**				9000
2007	2581	3707	6017	**12305**	2545	3030	5690	**11265**	3777	6191	**9968**				9000
2008	3171	3702	6067	**12940**	3150	3045	5886	**12081**	4071	6663	**10734**				9000
2009	4337	3990	6530	**14856**	4323	3271	6322	**13915**	3697	6480	**10176**				9000
2010	3761	3623	6350	**13734**	3734	2757	6022	**12513**	3096	6074	**9170**				9000
2011	3138	3034	5952	**12124**	3097	2183	5434	**10714**	2587	5627	**8214**				9000
2012	2529	2535	5515	**10579**	2487	1795	5208	**9490**	2489	5598	**8088**				9000
2013	2462	2439	5486	**10388**	2417	1700	5194	**9311**							9000
2014															
2015															
2016															
2017															
2018															
2019															
2020															
2021															
2022															
2023															
2024															
2025															

Survival and Initial Population Estimates

Year	Annual Juvenile Survival Rates			Annual Adult Survival Rates		
	Model Est	Field Est	SE	Model Est	Field Est	SE
1993	0.90			0.87		
1994	0.51			0.87		
1995	0.40			0.87		
1996	0.40			0.87		
1997	0.67			0.87		
1998	0.40			0.87		
1999	0.51			0.87		
2000	0.44			0.87		
2001	0.40			0.87		
2002	0.40			0.87		
2003	0.76			0.87		
2004	0.54			0.87		
2005	0.71			0.87		
2006	0.90			0.87		
2007	0.90			0.87		
2008	0.90			0.87		
2009	0.40			0.87		
2010	0.40			0.87		
2011	0.40			0.87		
2012	0.76			0.87		
2013	0.40			0.87		
2014						
2015						
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

Parameters:	Optim cells
Adult Survival =	0.873
Initial Total Male Pop/10,000 =	0.215
Initial Female Pop/10,000 =	0.392

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult survival	98%

	Classification Counts										Harvest	
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Males	Females	Juveniles	Total Harvest	Total Males	Females
1993		63.21	2.49	54.88	51.14	2.15	648	482	61	1191	33.1	13.5
1994		80.37	3.67	56.54	63.63	3.11	390	98	19	507	19.1	2.7
1995		72.06	3.26	56.15	57.95	2.81	373	81	11	465	17.5	2.1
1996		99.05	4.32	53.75	58.01	2.95	366	143	10	519	18.1	3.8
1997		55.74	3.65	55.13	47.63	3.28	387	123	22	532	18.1	3.2
1998		93.70	4.88	55.19	58.14	3.47	416	127	24	567	18.9	3.2
1999		67.78	3.61	54.78	55.73	3.15	382	115	10	507	17.1	2.8
2000		75.17	3.53	54.67	54.67	2.83	413	135	12	560	18.2	3.3
2001		65.81	3.22	53.96	59.52	3.01	292	95	33	420	13.0	2.3
2002		71.51	3.78	54.06	48.95	2.91	400	161	8	569	18.2	4.0
2003		75.31	3.57	52.87	52.17	2.77	419	170	11	600	20.0	4.3
2004		83.91	3.66	57.46	56.26	2.76	514	184	47	745	20.2	4.2
2005		84.93	3.71	57.67	57.67	2.82	585	211	29	825	21.8	4.5
2006		52.60	2.64	60.06	53.91	2.68	612	340	17	969	19.4	6.5
2007		42.90	2.03	61.61	61.62	2.59	615	297	33	945	18.2	5.4
2008		52.26	2.86	61.01	64.30	3.30	597	165	19	781	17.7	3.0
2009		66.42	3.01	61.11	66.83	3.03	654	189	13	856	18.0	3.2
2010		59.23	3.18	57.05	60.52	3.23	787	298	25	1110	23.9	5.2
2011		52.72	2.47	50.97	49.85	2.38	774	471	37	1282	28.1	8.7
2012		45.86	3.06	45.97	44.46	3.00	673	279	38	990	29.2	5.6
2013		44.88	3.02	44.46	44.46	3.00	650	160	15	825	30.3	5.3
2014												
2015												
2016												
2017												
2018												
2019												
2020												
2021												
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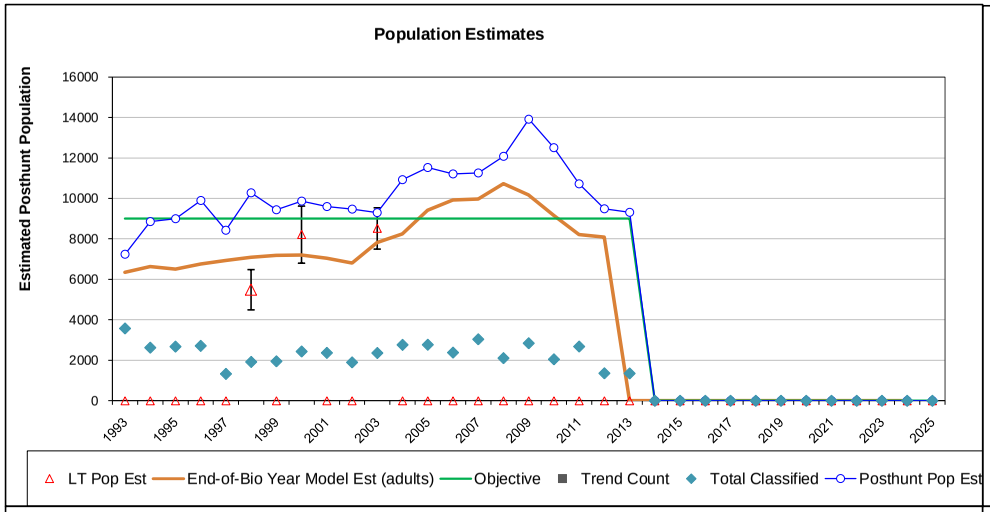
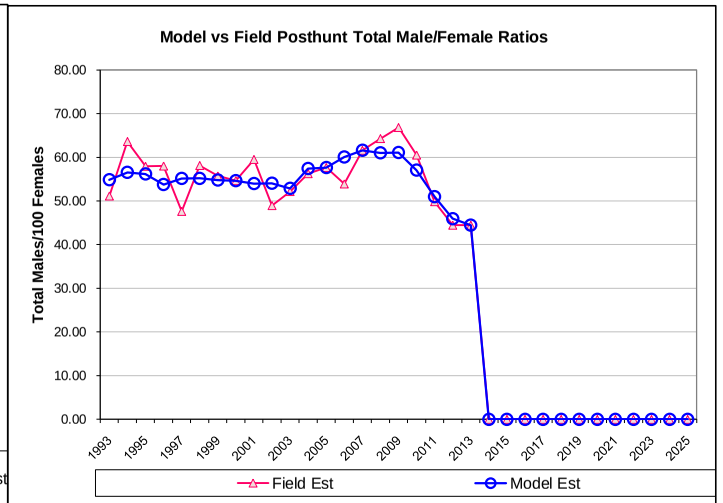
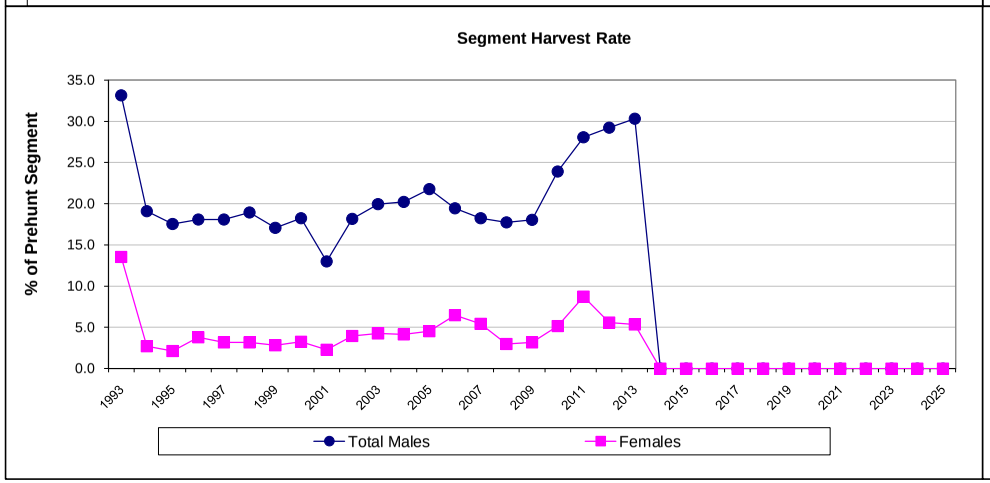
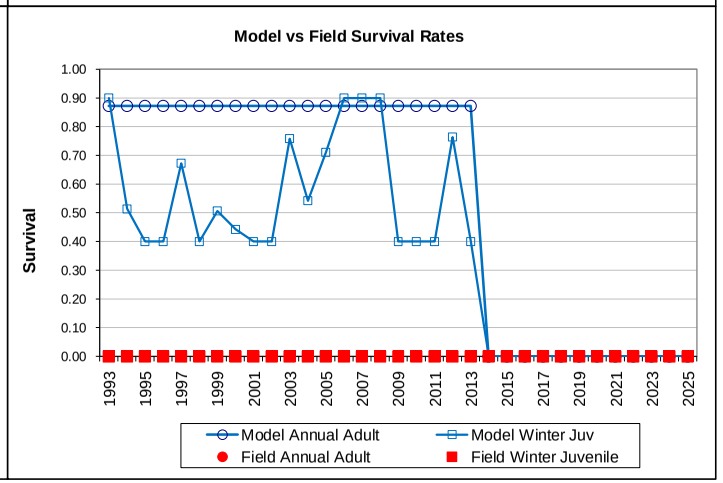
2023												
2024												
2025												

FIGURES





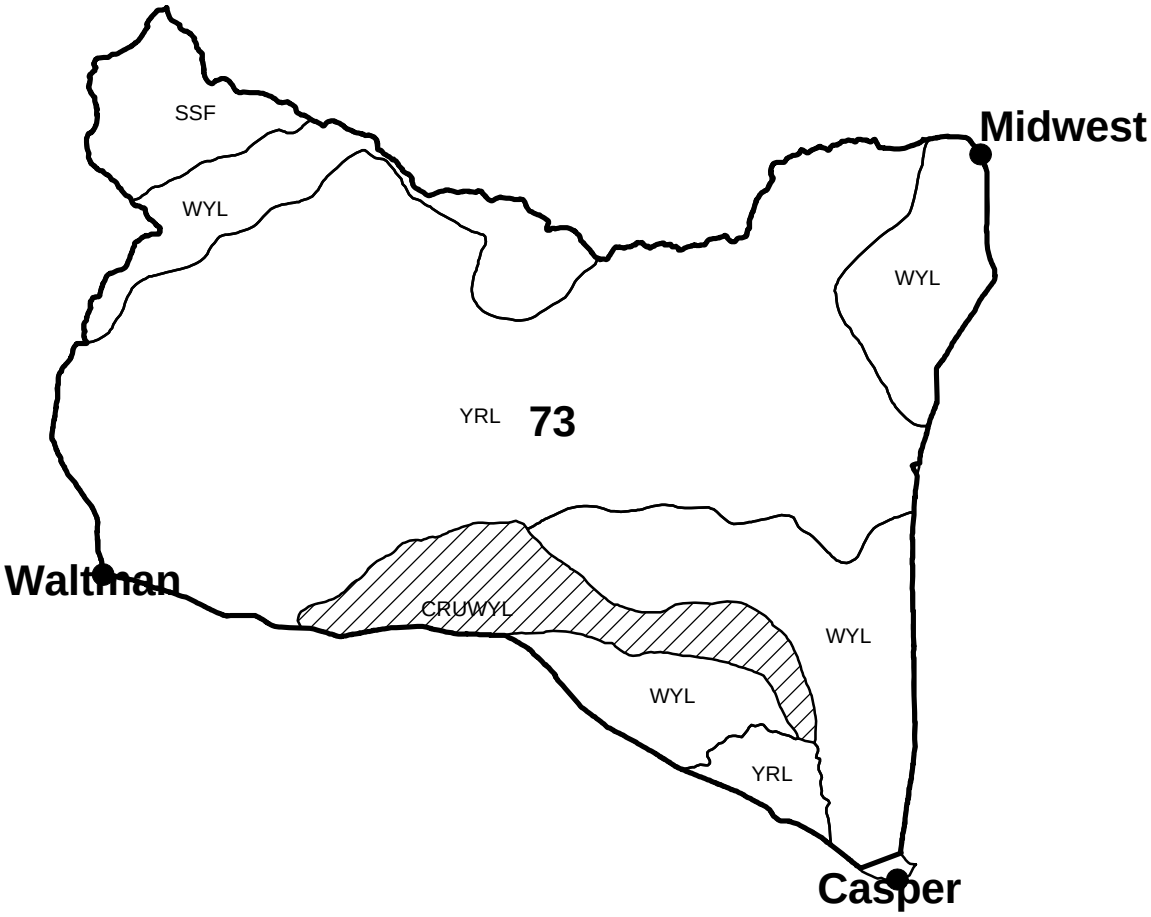




Comments:

END

Antelope - North Natrona
Hunt Area 73
Casper Region
Revised 4/88



2012 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2012 - 5/31/2013

HERD: PR748 - NORTH CONVERSE

HUNT AREAS: 25-26

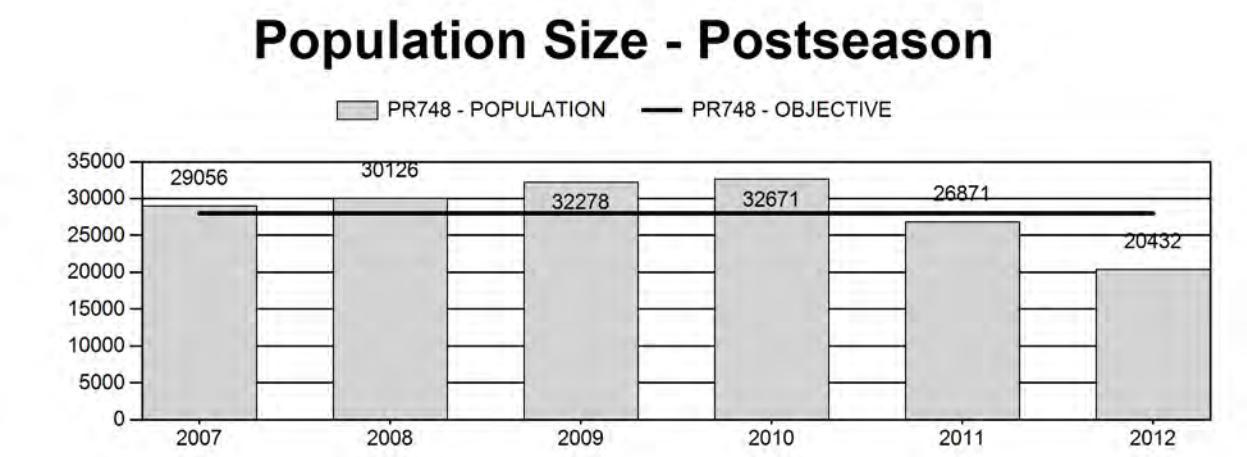
PREPARED BY: ERIKA PECKHAM

	2007 - 2011 Average	2012	2013 Proposed
Population:	30,200	20,432	17,463
Harvest:	2,784	3,169	2,395
Hunters:	2,856	3,822	3,000
Hunter Success:	97%	83%	80%
Active Licenses:	3,034	3,964	2,850
Active License Percent:	92%	80%	84%
Recreation Days:	9,599	11,944	9,000
Days Per Animal:	3.4	3.8	3.8
Males per 100 Females	70	59	
Juveniles per 100 Females	73	66	

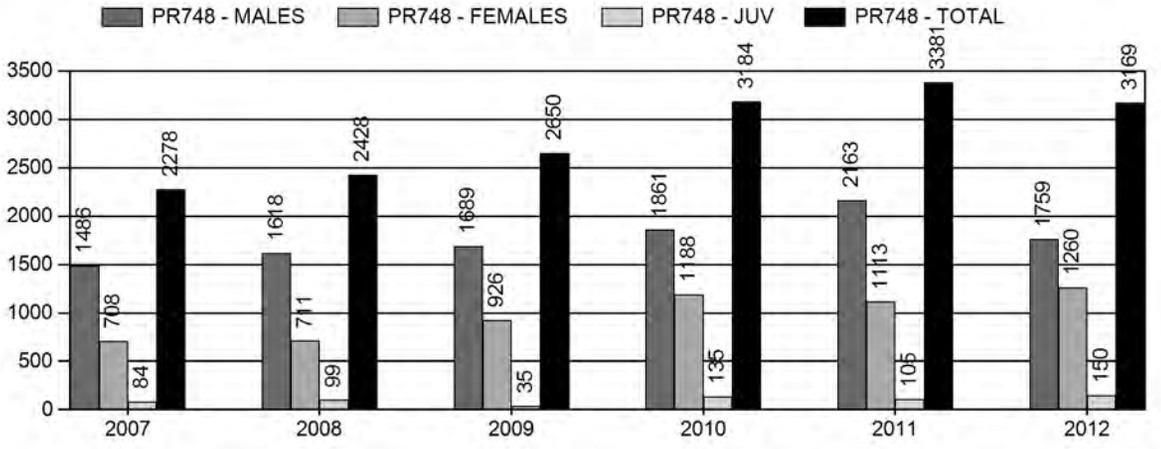
Population Objective:	28,000
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-27.0%
Number of years population has been + or - objective in recent trend:	3
Model Date:	02/22/2013

Proposed harvest rates (percent of pre-season estimate for each sex/age group):

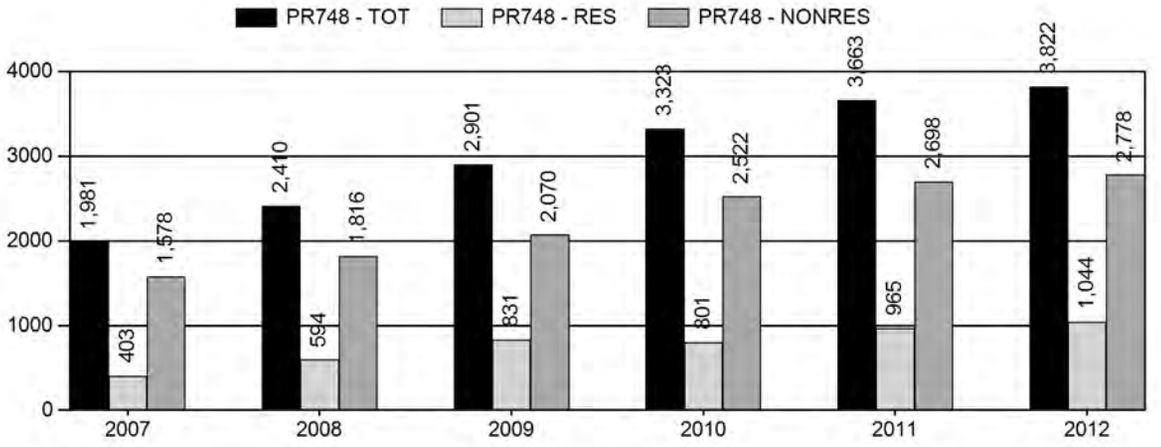
	JCR Year	Proposed
Females ≥ 1 year old:	10%	10%
Males ≥ 1 year old:	28%	33%
Juveniles (< 1 year old):	1%	0%
Total:	12%	12%
Proposed change in post-season population:	-8%	-15%



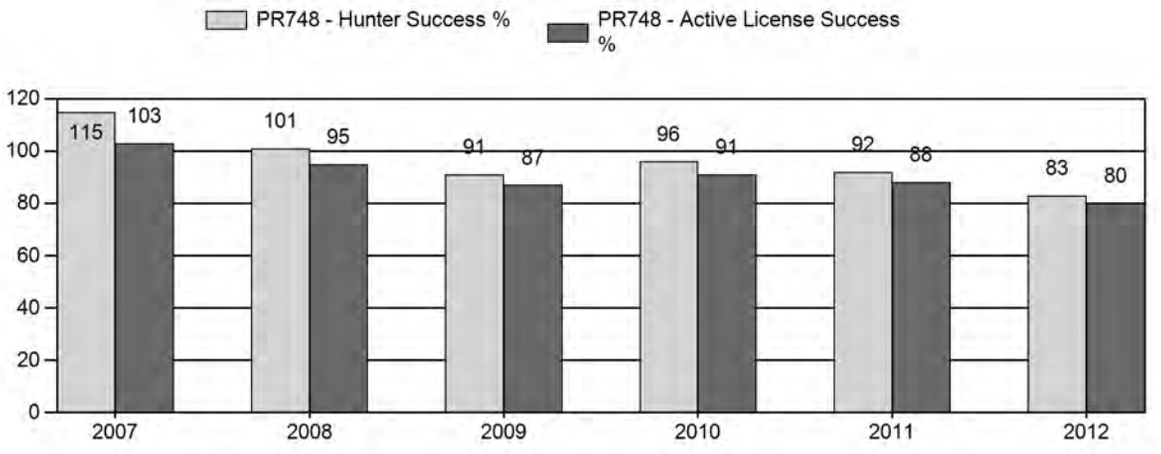
Harvest



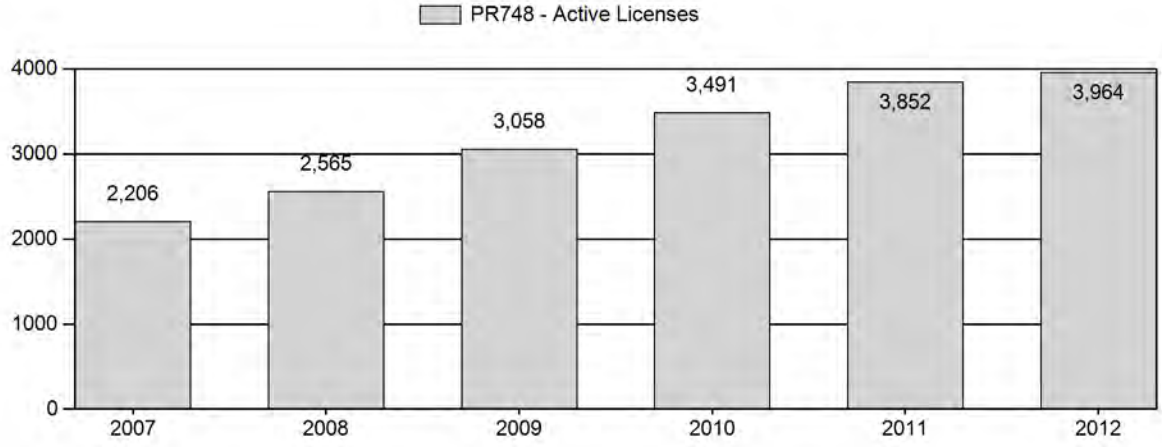
Number of Hunters



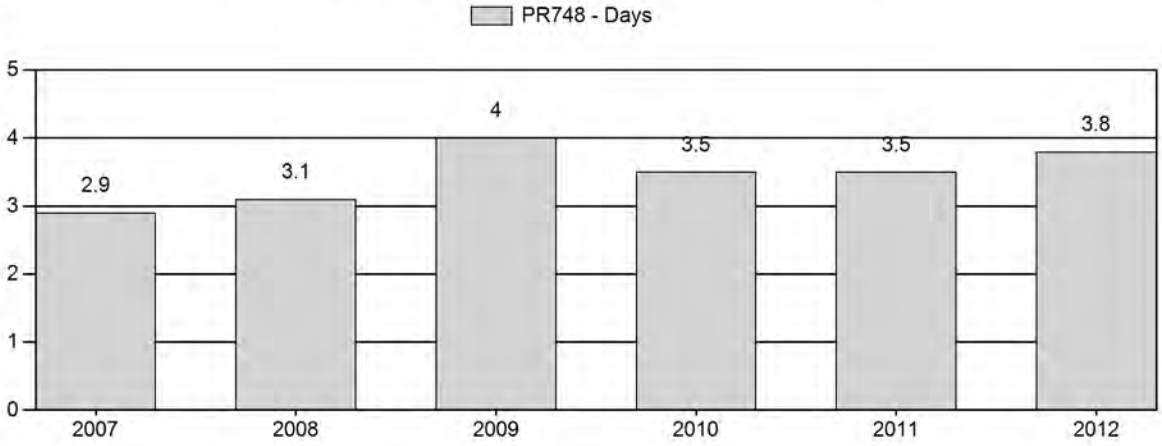
Harvest Success



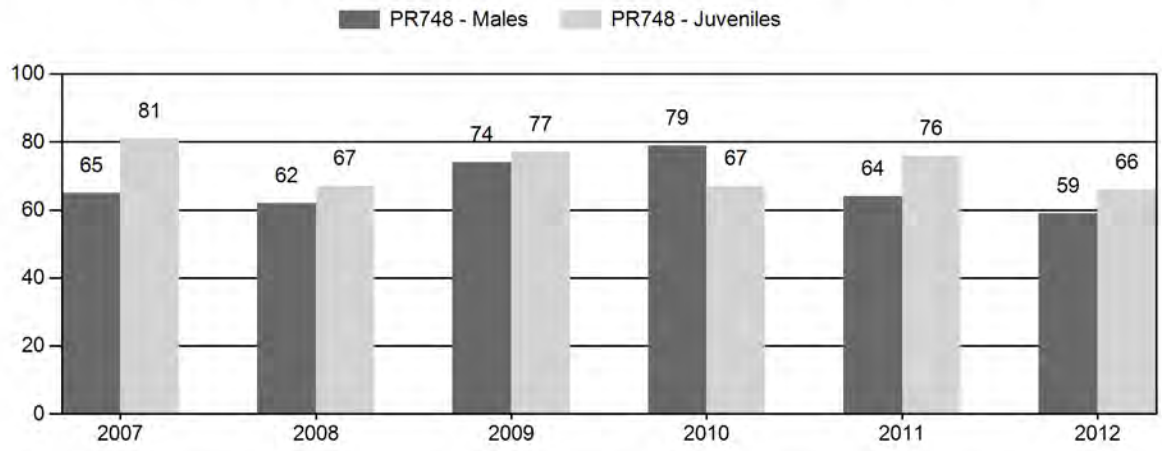
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2007 - 2012 Preseason Classification Summary

for Pronghorn Herd PR748 - NORTH CONVERSE

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2007	31,562	343	442	785	27%	1,200	41%	974	33%	2,959	3,523	29	37	65	± 5	81	± 5	49
2008	32,797	289	488	777	27%	1,248	44%	832	29%	2,857	3,496	23	39	62	± 4	67	± 5	41
2009	35,193	312	740	1,052	29%	1,430	40%	1,101	31%	3,583	3,287	22	52	74	± 5	77	± 5	44
2010	36,174	373	807	1,180	32%	1,490	41%	999	27%	3,669	3,160	25	54	79	± 5	67	± 4	37
2011	30,590	93	480	573	27%	895	42%	683	32%	2,151	3,105	10	54	64	± 5	76	± 6	47
2012	23,918	82	253	335	26%	567	44%	376	29%	1,278	3,040	14	45	59	± 7	66	± 7	42

2013 HUNTING SEASONS
NORTH CONVERSE PRONGHORN HERD (PR748)

Hunt Area	Type	Dates of Seasons Opens	Closes	Quota	Limitations
25	1	Oct. 1	Oct. 14	900	Limited quota licenses; any antelope
	6	Oct. 1	Oct. 14	500	Limited quota licenses; doe or fawn
26	1	Sep. 24	Oct. 14	1,200	Limited quota licenses; any antelope
	6	Sep. 24	Oct. 14	800	Limited quota licenses; doe or fawn
Archery		Aug. 15	Sep. 30		Refer to license type and limitations in Section 3

Hunt Area	Type	Quota change from 2012
25	1	-100
	6	-300
26	1	-300
	6	-400
Herd Unit Total	**1**	**-400**
	6	**-700**

Management Evaluation
Current Postseason Population Management Objective: 28,000
Management Strategy: Recreational
2012 Postseason Population Estimate: ~20,400
2013 Proposed Postseason Population Estimate: ~17,500

Herd Unit Issues

The management objective for the North Converse Pronghorn Herd Unit is a post-season population objective of 28,000 pronghorn. This herd is managed under the recreational management strategy, with a goal of maintaining preseason buck ratios between 30-59 bucks per 100 does. The objective and management strategy were last revised in 1989.

Public hunting access within the herd unit is poor, with only small tracts of accessible public land interspersed with predominantly private lands. Two Walk-In Areas provide some additional hunting opportunity, although they are relatively small in size. Primary land uses in this herd unit include extensive oil and gas production, large-scale industrial wind generation, In-Situ uranium production, and traditional cattle and sheep grazing. In recent years, expansion of oil shale development has dramatically escalated anthropogenic disturbance throughout this herd unit.

Weather

Weather conditions throughout 2012 and into 2013 were extremely dry and warmer than normal. The winters of 2011-2012 and 2012-13 were mild and with little snow accumulation. As a result, over winter survival was likely high in bio-year 2011 and is presumed to again be good in bio-year 2012. Although the model suggests low juvenile survival rates, field observations indicate otherwise.

Habitat

Although there are no habitat transects in this herd unit, current habitat conditions are generally poor due to the extreme drought realized in 2012. Anecdotal observations by personnel confirm this, as there was little to no herbaceous and sagebrush forage production. In addition to poor leader growth production in 2012, sagebrush communities are likely experiencing heavy browsing pressure given remaining pronghorn densities in conjunction with large-scale domestic sheep production.

Field Data

Although the spring and summer of 2012 were extraordinarily dry, it appears fawn productivity and over-summer survival did not suffer. In 2012, the fawn to doe ratio was 66, which is below the preceding 5-year average of 73 fawns per 100 does, but much higher than that of adjacent herds. Buck ratios remained fairly high in 2012 at 59, although they decreased when compared to the preceding 5-year average of 70. Prior to 2012, buck ratios have exceeded management strategy maximums due to difficult access and the preponderance of outfitting in this herd unit. In recent years, it has been increasingly difficult to meet classification sample sizes in this herd unit. In 2012, the adequate sample size was 3,100 animals, yet only 1,280 pronghorn were classified. This further corroborates the notion that this population has declined, as classification sample sizes have declined dramatically in recent years despite similar levels of effort.

Harvest

This herd has the potential for rapid growth as has been seen in years past. High fawn productivity coupled with limited access have allowed this herd to exceed the management objective as recently as 2010. However, this population has recently dropped below objective and is predicted to continue to decline. As such, the reduction in licenses was warranted for 2013 to manage this herd back toward objective. In 2012 there were 4,500 licenses available (2,500 Type 1 and 2,000 Type 6). All but 92 Type 6 licenses in hunt area 25 were sold by the

close of the season. Again, the largest issue with achieving adequate harvest in this herd is access, as most of the pronghorn are found on private lands.

License success in this herd unit has averaged 92% over the preceding 5 years. In 2012, license success declined to 80%, indicating hunters had a much more difficult time locating and harvesting pronghorn in this herd unit. Days per animal also increased from the previous 5-year average.

Population

The 2012 post-season population estimate is around 20,400, which according to the current model is the lowest number this herd has experienced since before 1993. This population began to decline following elevated mortality during the relatively severe 2010-2011 winter. The last line transect survey was conducted in this herd unit in May of 2004, which resulted in an estimated end-of-year population of 31,000 pronghorn.

The "Time Specific Juvenile – Constant Adult Mortality Rate" (TSJ-CA) spreadsheet model was chosen for the post-season population estimate of this herd. Although this model did not have the lowest relative AIC (154), they were all fairly close with the TSJ-CA model most accurately representing what was occurring on the ground, based on field personnel and landowner perceptions. Population trends seemed to simulate what field personnel and nearly all landowners were observing in this herd unit. This model is considered to be of fair quality.

Management Strategy

The traditional season in this hunt area has been from October 1st to October 14th in hunt area 25 and from September 24th to October 14th in hunt area 26. These season dates have typically been adequate to meet landowner desires while allowing a reasonable harvest. For 2013, the number of both Type 1 and Type 6 licenses were decreased by 400 and 700, respectively. These reductions were warranted to decrease harvest pressure on both males and females given this population is now ~27% below objective and predicted to continue to decline.

If we attain the projected harvest of ~2,400 individuals and near normal fawn recruitment, this pronghorn population is projected to decrease slightly. Based on the model, we predict a 2013 postseason population of about 17,500 pronghorn.

INPUT	
Species:	Pronghorn
Biologist:	Erika Peckham
Herd Unit & No.:	North Converse (PR748)
Model date:	02/22/13

☐ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	**Constant Juvenile & Adult Survival**	130	139	☐ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	130	139	☐ SCJ,SCA M	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	46	154	☑ TSJ,CA Model	

Population Estimates from Top Model

Year	Predicted Prehunt Population (year *i*)			Total	Predicted Posthunt Population (year *i*)			Total	Predicted adult End-of-bio-year Pop (year *i*)			LT Population Estimate		Trend Count	Objective
	Juveniles	Total Males	Females		Juveniles	Total Males	Females		Total Males	Females	Total Adults	Field Est	Field SE		
1993	7757	9881	15186	**32825**	7667	8171	13984	**29822**	9368	14139	**23507**				28000
1994	12736	9181	13856	**35772**	12542	7075	12671	**32289**	7711	12397	**20108**				28000
1995	9953	7556	12149	**29659**	9770	5759	11235	**26765**	8434	13017	**21451**				28000
1996	13274	8266	12757	**34296**	13212	6103	12316	**31631**	10039	15396	**25435**				28000
1997	11036	9838	15088	**35962**	10984	8039	14621	**33644**	11091	16659	**27749**				28000
1998	15742	10869	16325	**42937**	15712	8985	16012	**40708**	9986	15962	**25949**				28000
1999	13000	9786	15643	**38429**	12956	7970	15361	**36286**	8621	14881	**23502**				28000
2000	12674	8449	14583	**35706**	12636	6700	14143	**33479**	7554	13807	**21361**	20200	2901		28000
2001	9827	7403	13531	**30760**	9785	5991	13225	**29000**	7198	13238	**20437**				28000
2002	11128	7054	12974	**31155**	11108	5696	12585	**29389**	7028	12763	**19791**	18507	3491		28000
2003	9994	6888	12508	**29389**	9921	5597	12140	**27659**	6207	11653	**17859**				28000
2004	9938	6082	11420	**27440**	9871	4758	11052	**25681**	8053	13308	**21361**	30769	4602		28000
2005	9827	7892	13042	**30760**	9733	6467	12431	**28632**	6830	11788	**18618**				28000
2006	9742	6693	11552	**27988**	9700	5337	10975	**26012**	8433	13122	**21555**				28000
2007	10438	8264	12860	**31562**	10346	6630	12081	**29056**	9702	14259	**23961**				28000
2008	9316	9508	13974	**32797**	9207	7728	13191	**30126**	10027	14624	**24651**				28000
2009	11035	9826	14332	**35193**	10996	7968	13313	**32278**	11028	15495	**26523**				28000
2010	10181	10807	15185	**36174**	10033	8760	13879	**32671**	8575	12840	**21416**				28000
2011	9603	8404	12583	**30590**	9487	6025	11359	**26871**	6725	10631	**17356**				28000
2012	6909	6590	10419	**23918**	6741	4659	9033	**20432**	5037	8841	**13877**				28000
2013	6498	4936	8664	**20098**	6388	3313	7762	**17463**							28000
2014															28000
2015															28000
2016															28000
2017															28000
2018															28000
2019															28000
2020															28000
2021															28000
2022															28000
2023															28000
2024															28000
2025															28000

Survival and Initial Population Estimates

Year	Annual Juvenile Survival Rates			Annual Adult Survival Rates		
	Model Est	Field Est	SE	Model Est	Field Est	SE
1993	0.82			0.79		
1994	0.40			0.79		
1995	0.85			0.79		
1996	0.83			0.79		
1997	0.90			0.79		
1998	0.40			0.79		
1999	0.40			0.79		
2000	0.40			0.79		
2001	0.54			0.79		
2002	0.49			0.79		
2003	0.40			0.79		
2004	0.90			0.79		
2005	0.40			0.79		
2006	0.90			0.79		
2007	0.90			0.79		
2008	0.90			0.79		
2009	0.90			0.79		
2010	0.40			0.79		
2011	0.40			0.79		
2012	0.40			0.79		
2013	0.40			0.79		
2014						
2015						
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

Parameters:	Optim cells
Adult Survival =	0.786
Initial Total Male Pop/10,000 =	0.988
Initial Female Pop/10,000 =	1.519

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult survival	98%

	Classification Counts						Harvest					
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Males	Females	Juveniles	Total Harvest	Total Males	Females
1993		51.08	1.47	65.07	65.07	1.74	1555	1093	82	2730	17.3	7.9
1994		91.92	2.77	66.26	66.93	2.20	1914	1077	176	3167	22.9	8.6
1995		81.92	2.48	62.20	61.74	2.03	1634	831	166	2631	23.8	7.5
1996		104.05	3.89	64.79	64.79	2.76	1966	401	56	2423	26.2	3.5
1997		73.14	2.82	65.21	60.82	2.48	1636	424	47	2107	18.3	3.1
1998		96.43	3.97	66.58	78.24	3.40	1713	285	28	2026	17.3	1.9
1999		83.10	3.77	62.56	60.50	3.01	1651	257	40	1948	18.6	1.8
2000		86.91	3.38	57.94	60.45	2.61	1590	400	35	2025	20.7	3.0
2001		72.62	3.07	54.72	53.09	2.48	1284	278	38	1600	19.1	2.3
2002		85.77	3.56	54.37	54.37	2.58	1235	353	18	1606	19.3	3.0
2003		79.90	4.25	55.07	55.90	3.31	1173	334	66	1573	18.7	2.9
2004		87.02	3.56	53.26	50.82	2.44	1204	334	61	1599	21.8	3.2
2005		75.35	2.71	60.51	65.42	2.46	1295	555	85	1935	18.1	4.7
2006		84.33	4.04	57.94	52.05	2.88	1233	525	38	1796	20.3	5.0
2007		81.17	3.50	64.26	65.42	3.00	1486	708	84	2278	19.8	6.1
2008		66.67	2.98	68.04	62.26	2.85	1618	711	99	2428	18.7	5.6
2009		76.99	3.09	68.56	73.57	2.99	1689	926	35	2650	18.9	7.1
2010		67.05	2.74	71.17	79.19	3.09	1861	1188	135	3184	18.9	8.6
2011		76.31	3.88	66.79	64.02	3.43	2163	1113	105	3381	28.3	9.7
2012		66.31	4.41	63.25	59.08	4.07	1756	1260	153	3169	29.3	13.3
2013		75.00	4.68	56.97	66.67	4.30	1475	820	100	2395	32.9	10.4
2014												
2015												
2016												
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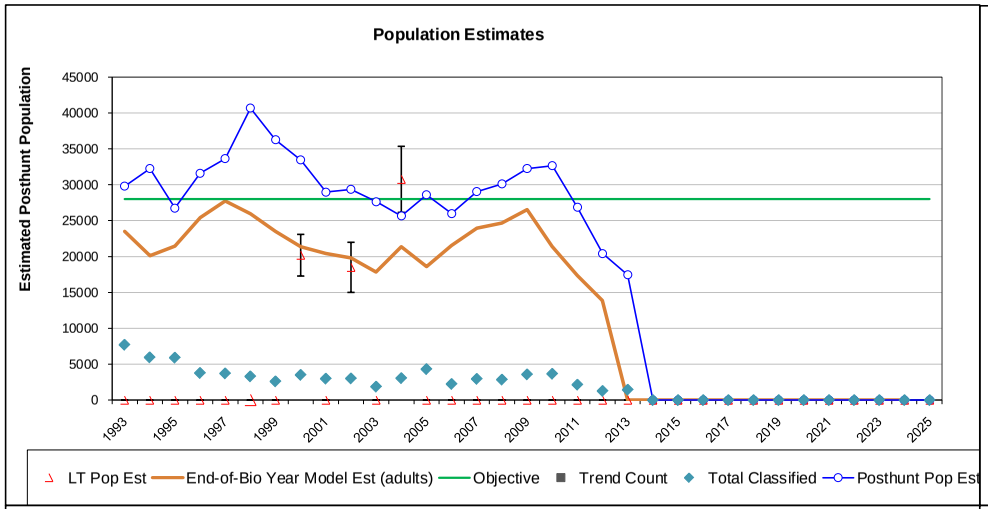
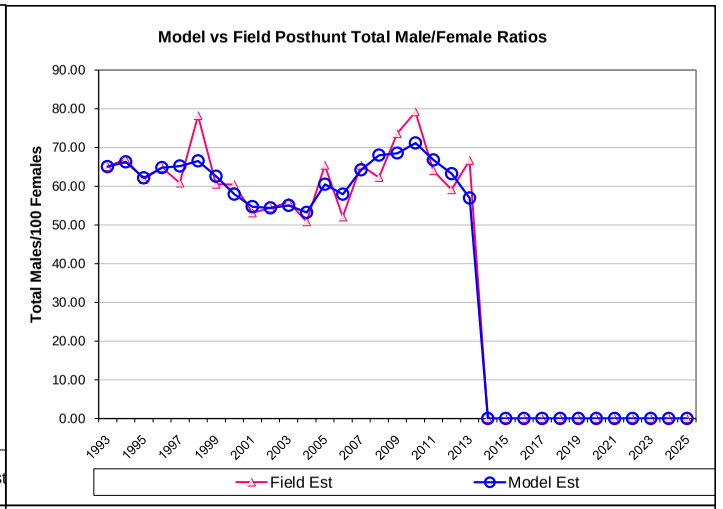
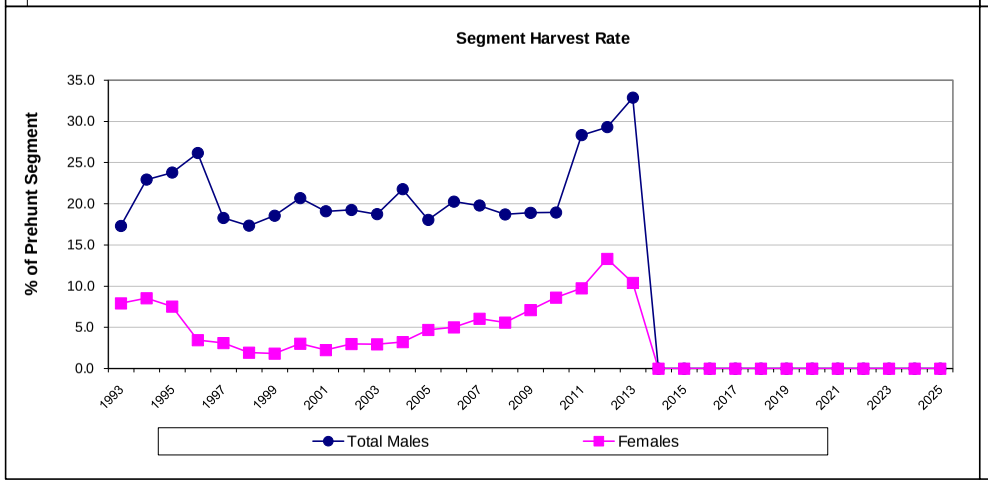
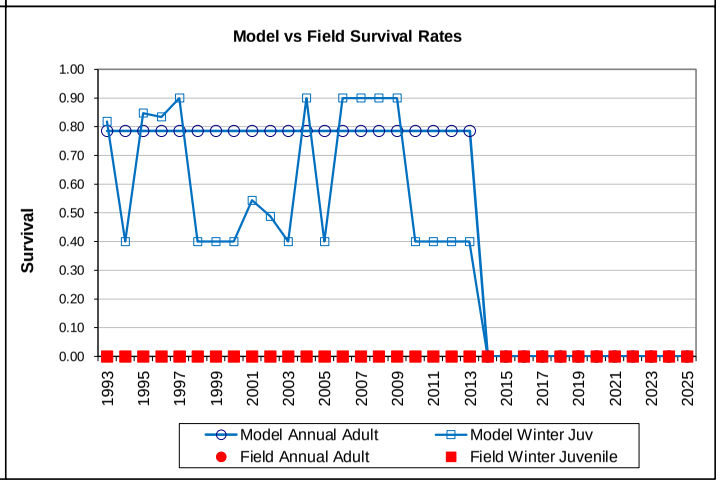
2022												
2023												
2024												
2025												

FIGURES









Comments:

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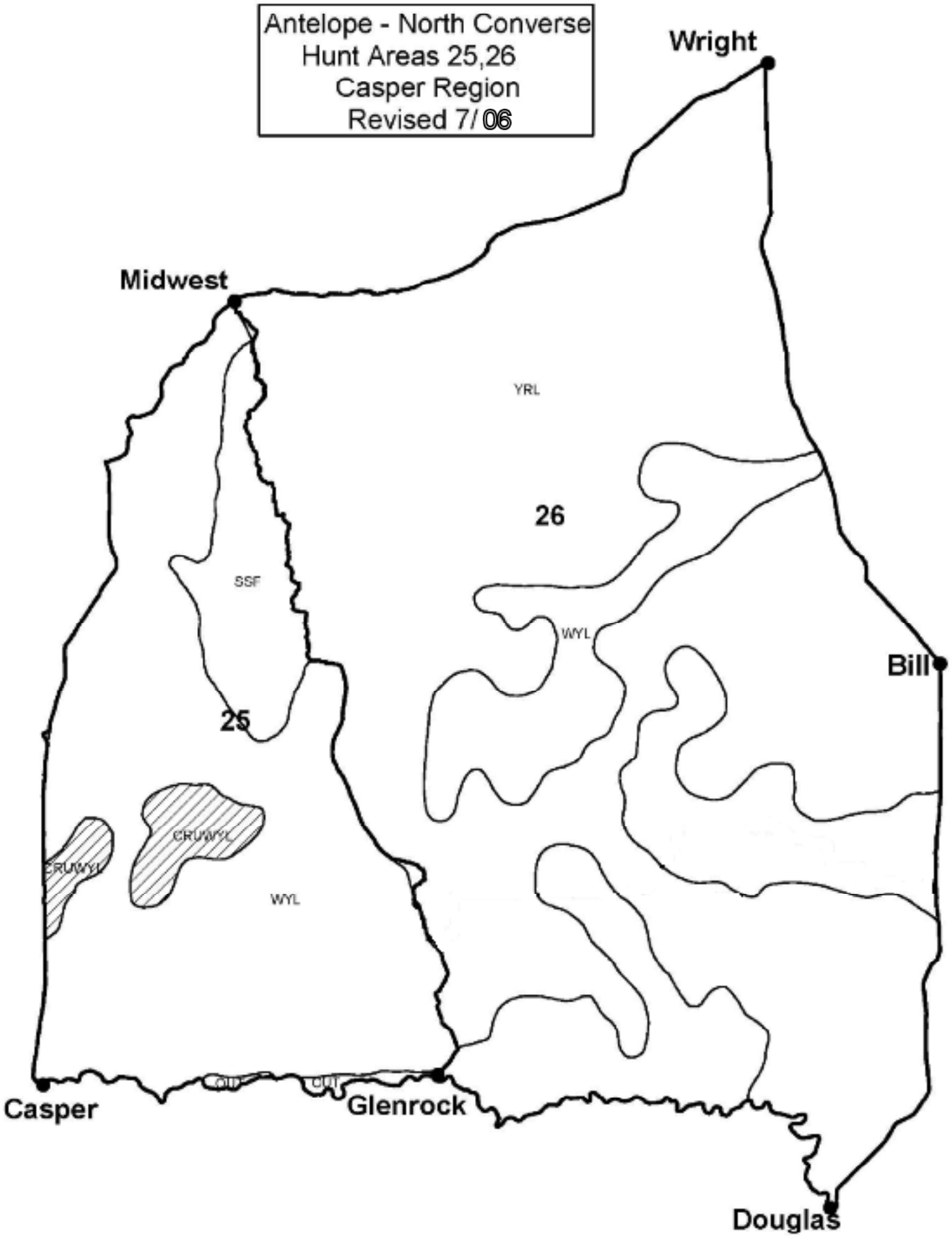
Antelope - North Converse
Hunt Areas 25,26
Casper Region
Revised 7/06
Wright
Midwest
YRL
26
SSF
WYL
Bill
25
CRUWYL
CRUWYL
WYL
Casper
Glenrock
Douglas